

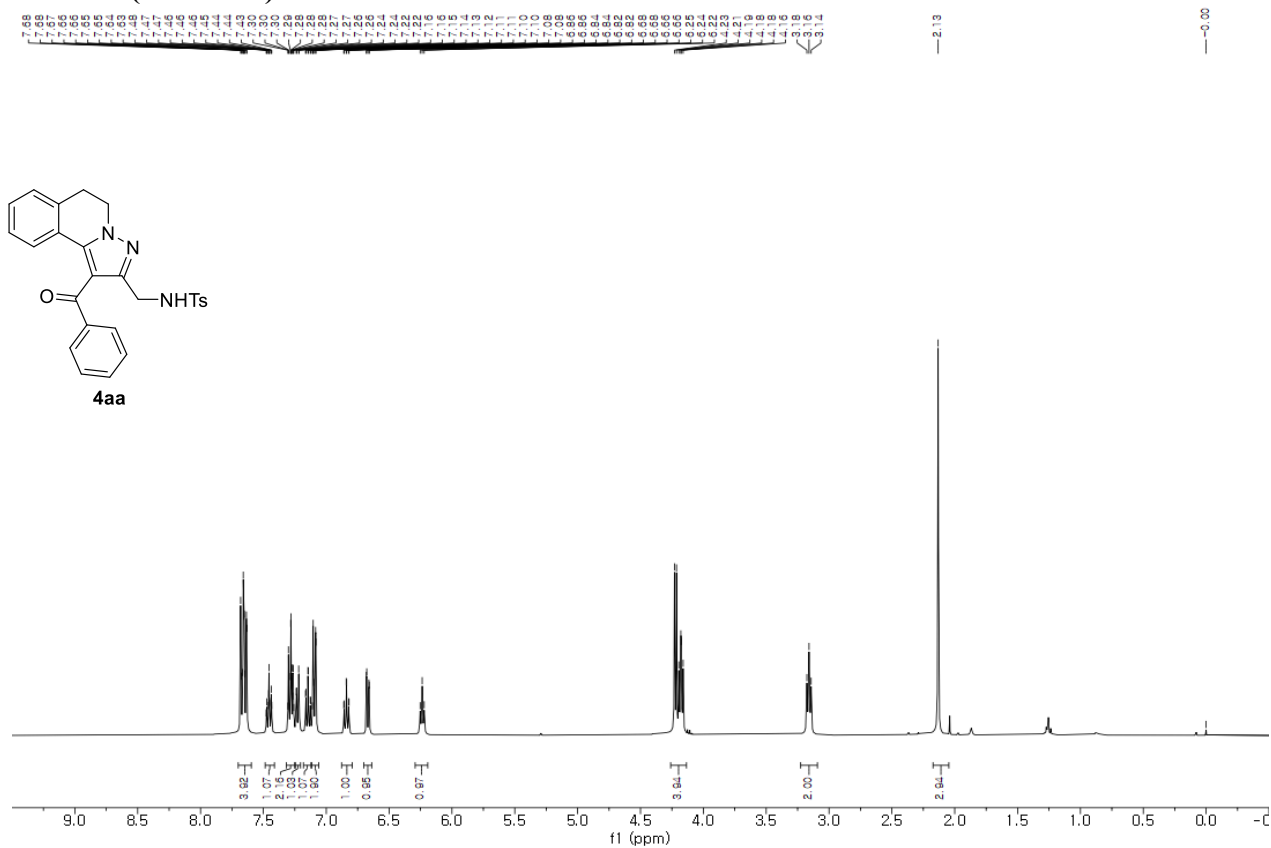
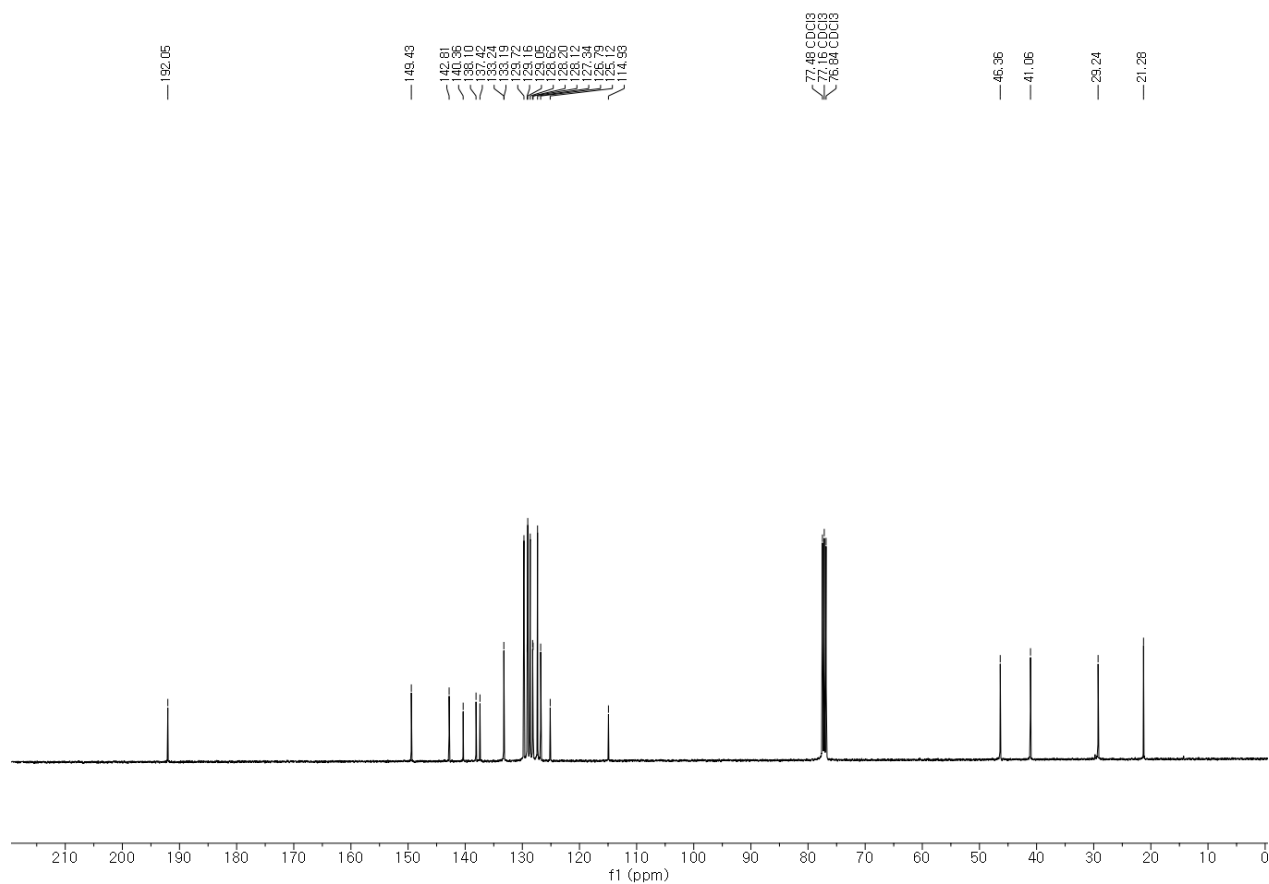
Supporting Information

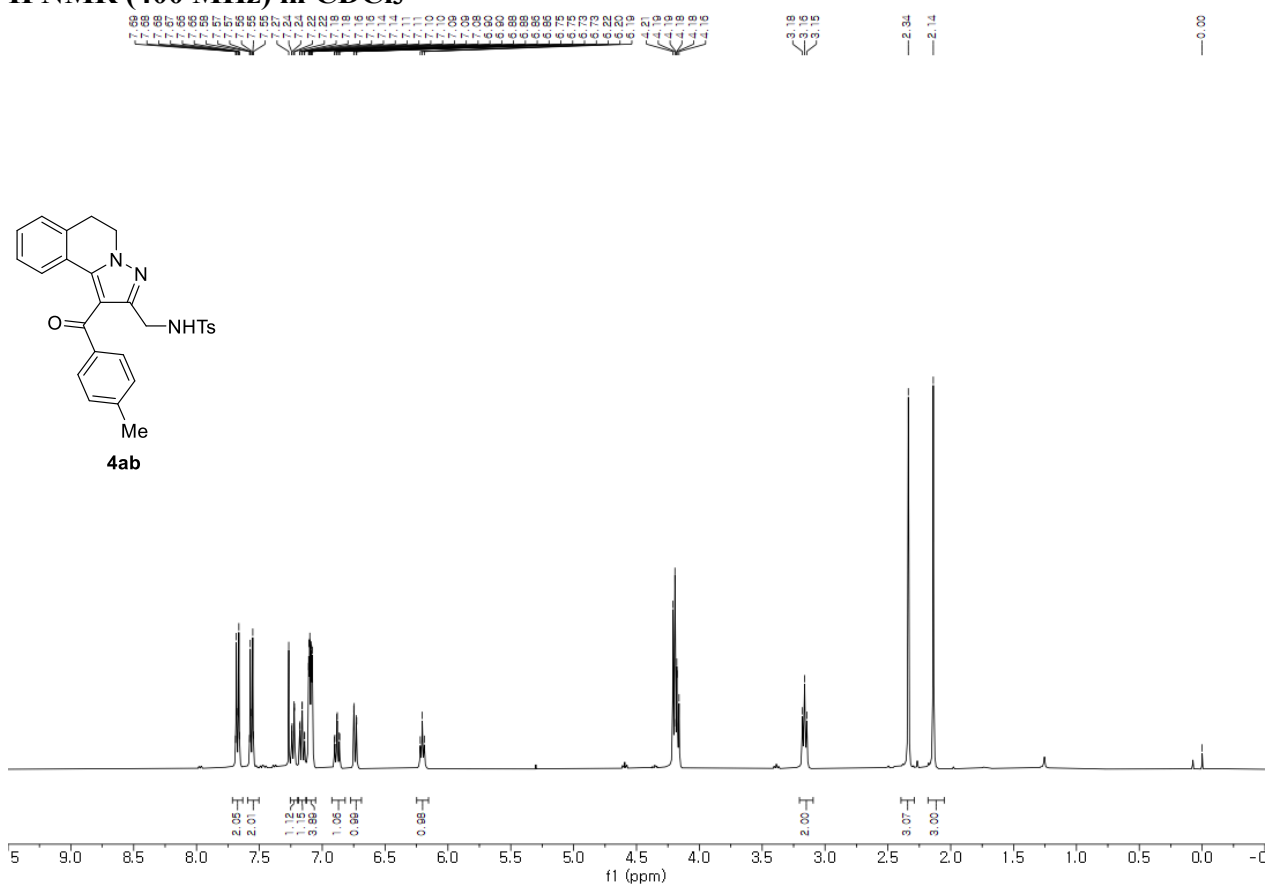
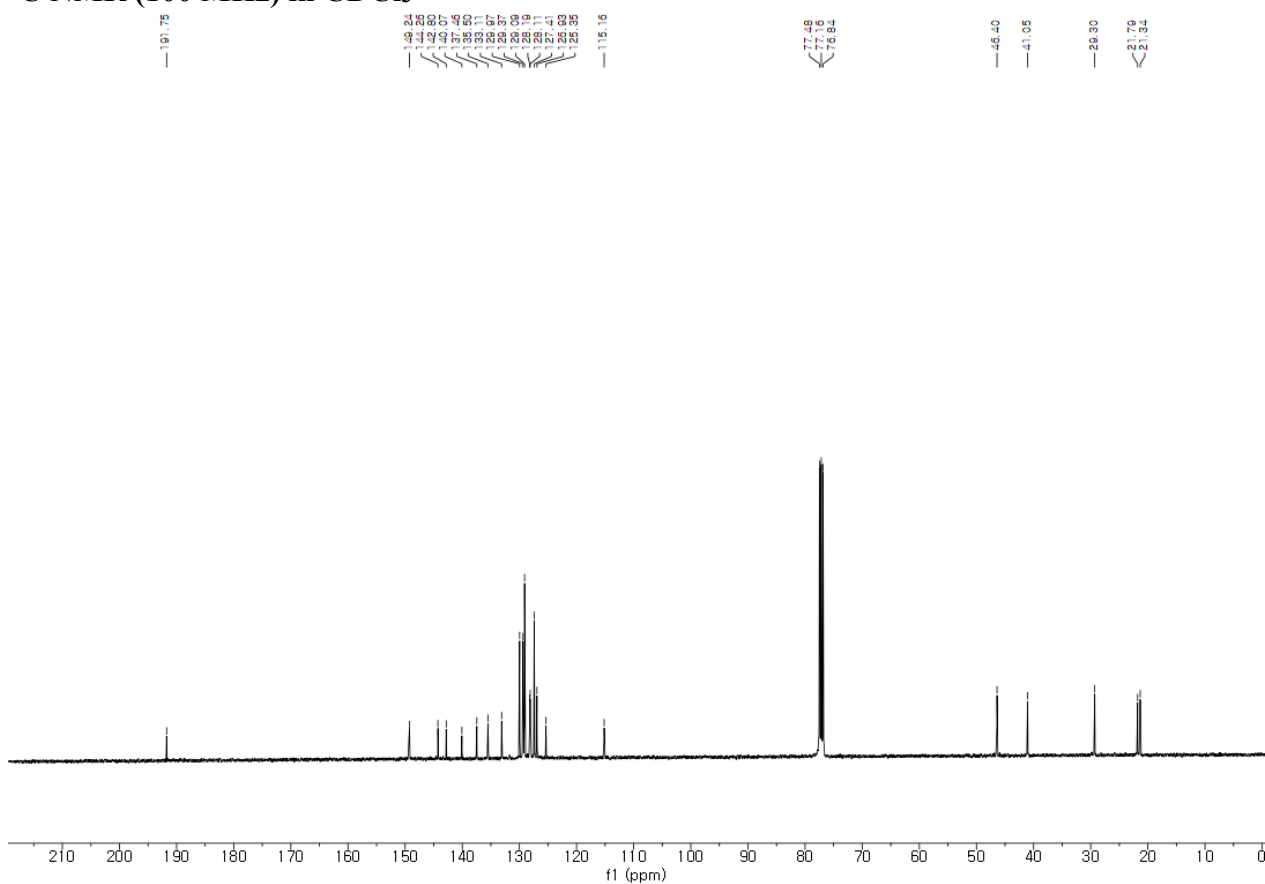
Synthesis of 5,6-Dihydropyrazolo[5,1-a]isoquinolines through Tandem Reaction of C,N-Cyclic Azomethine Imines with α,β -Unsaturated Ketones

Young Jae Yun and Sung-Gon Kim *

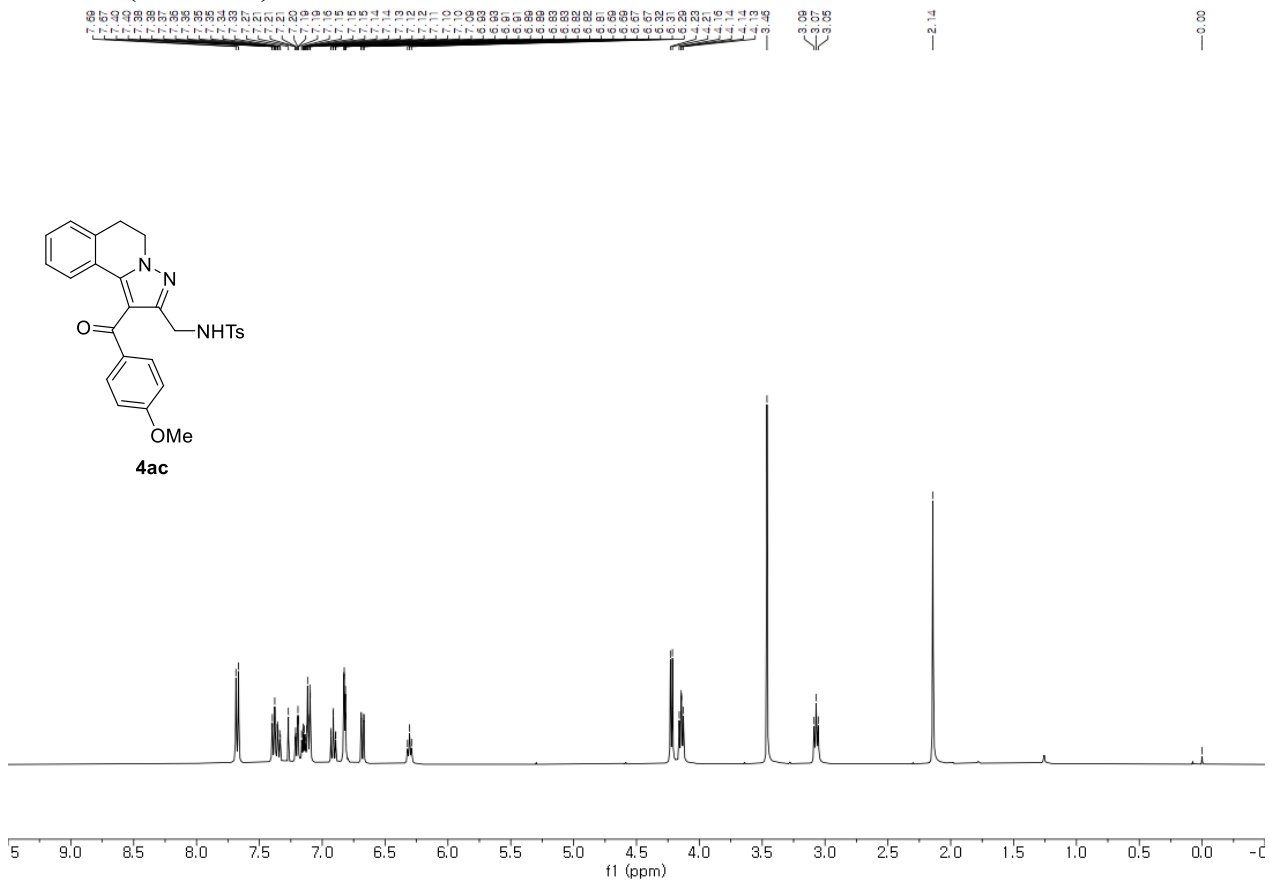
Department of Chemistry, Kyonggi University, 154-42, Gwanggyosan-ro, Yeongtong-gu,
Suwon 16227, Republic of Korea

* Correspondence: sgkim123@kyonggi.ac.kr

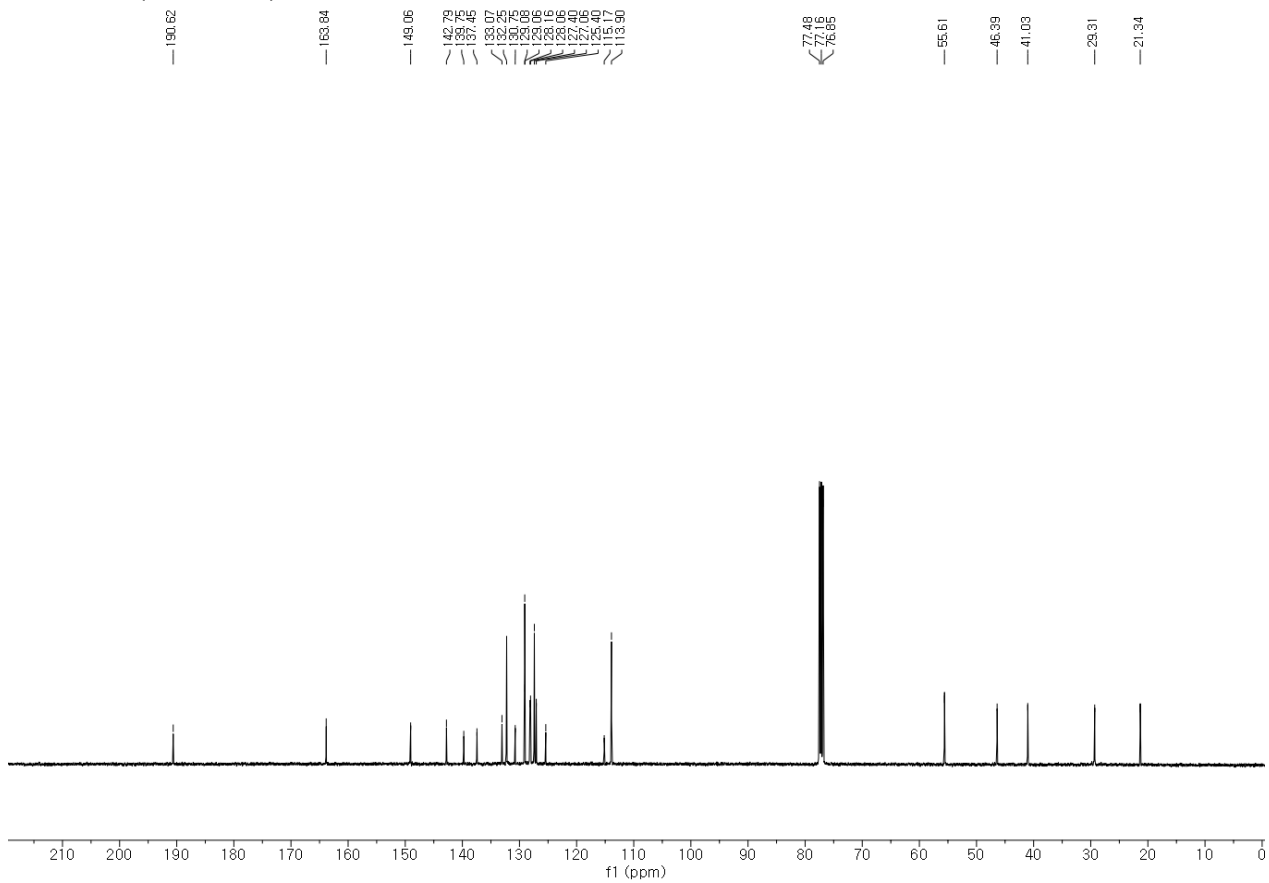
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

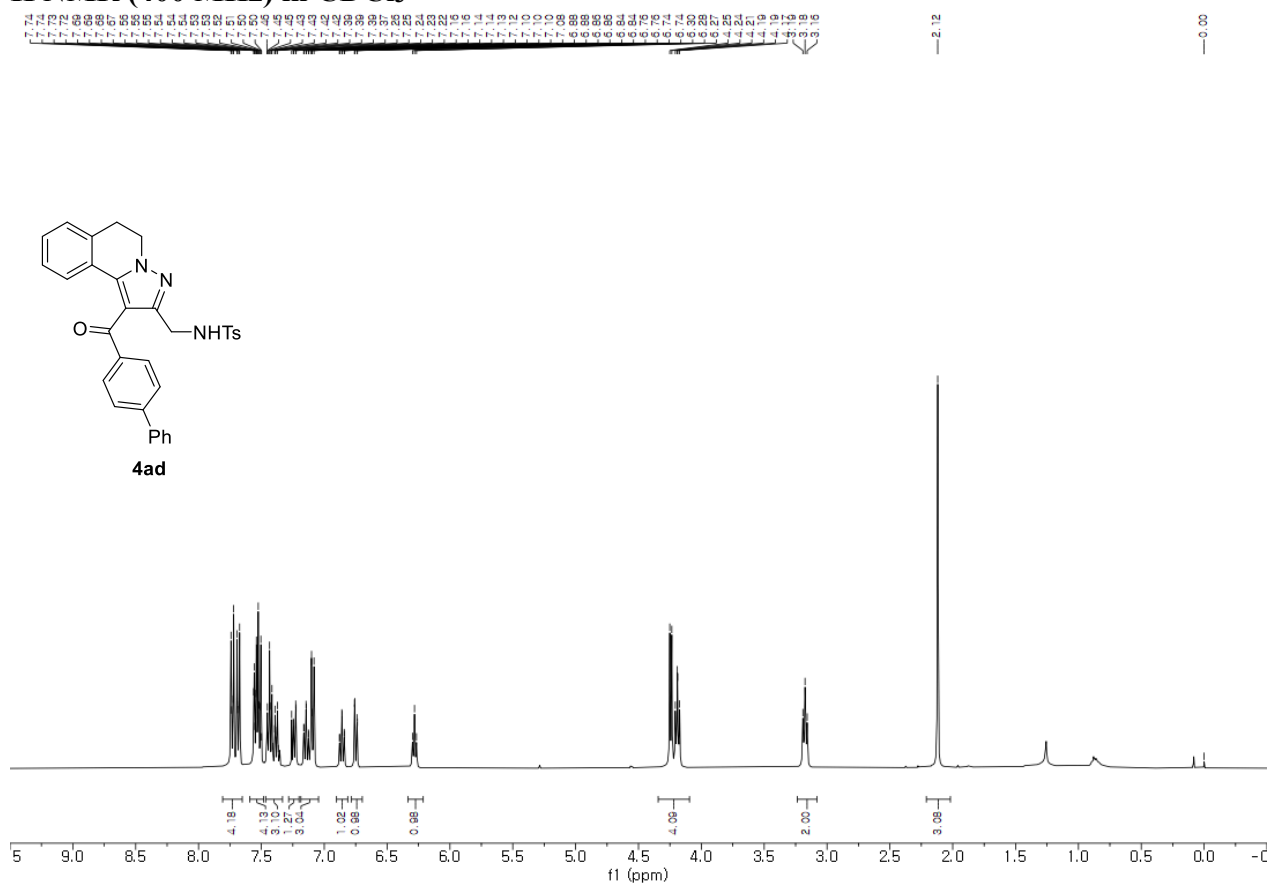
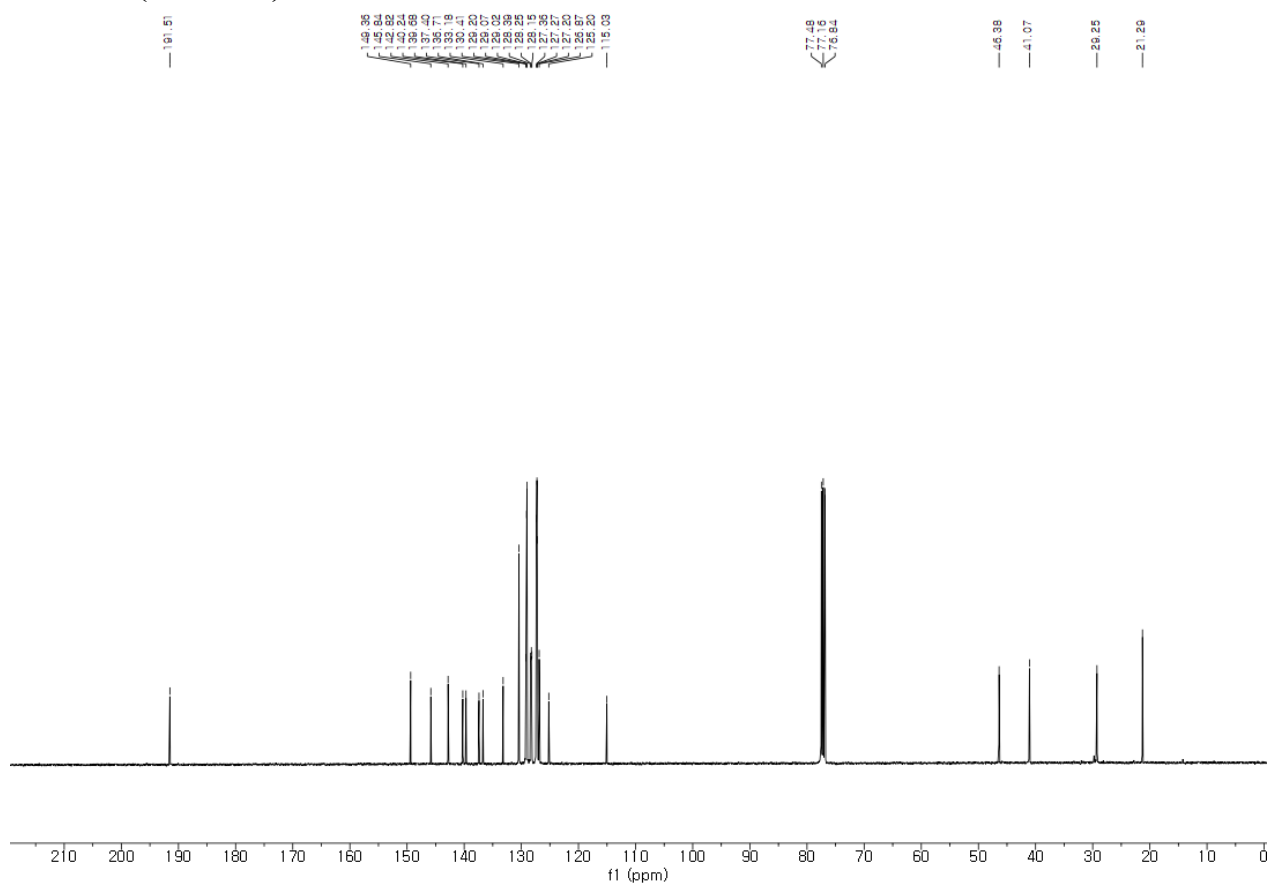
¹H NMR (400 MHz) in CDCl₃**¹³C NMR (100 MHz) in CDCl₃**

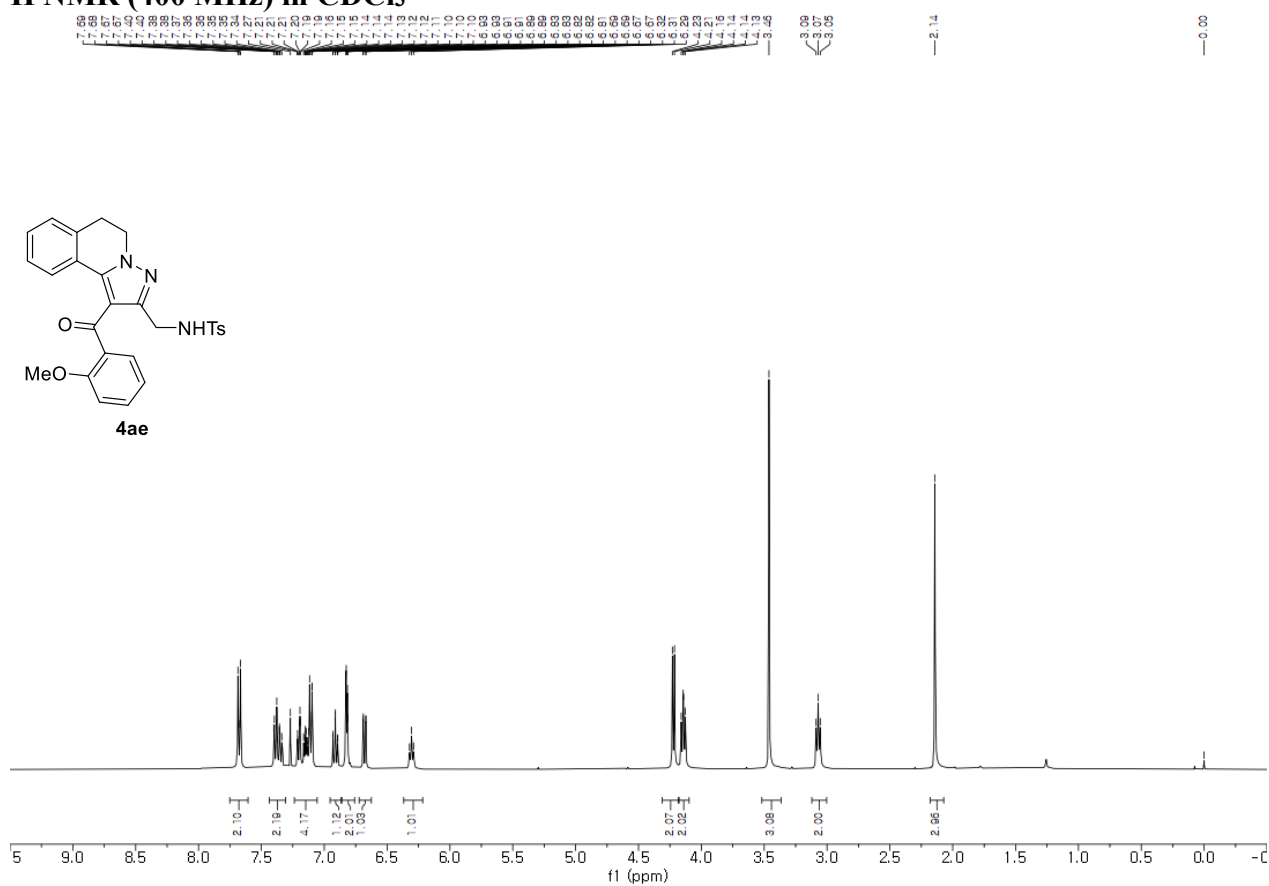
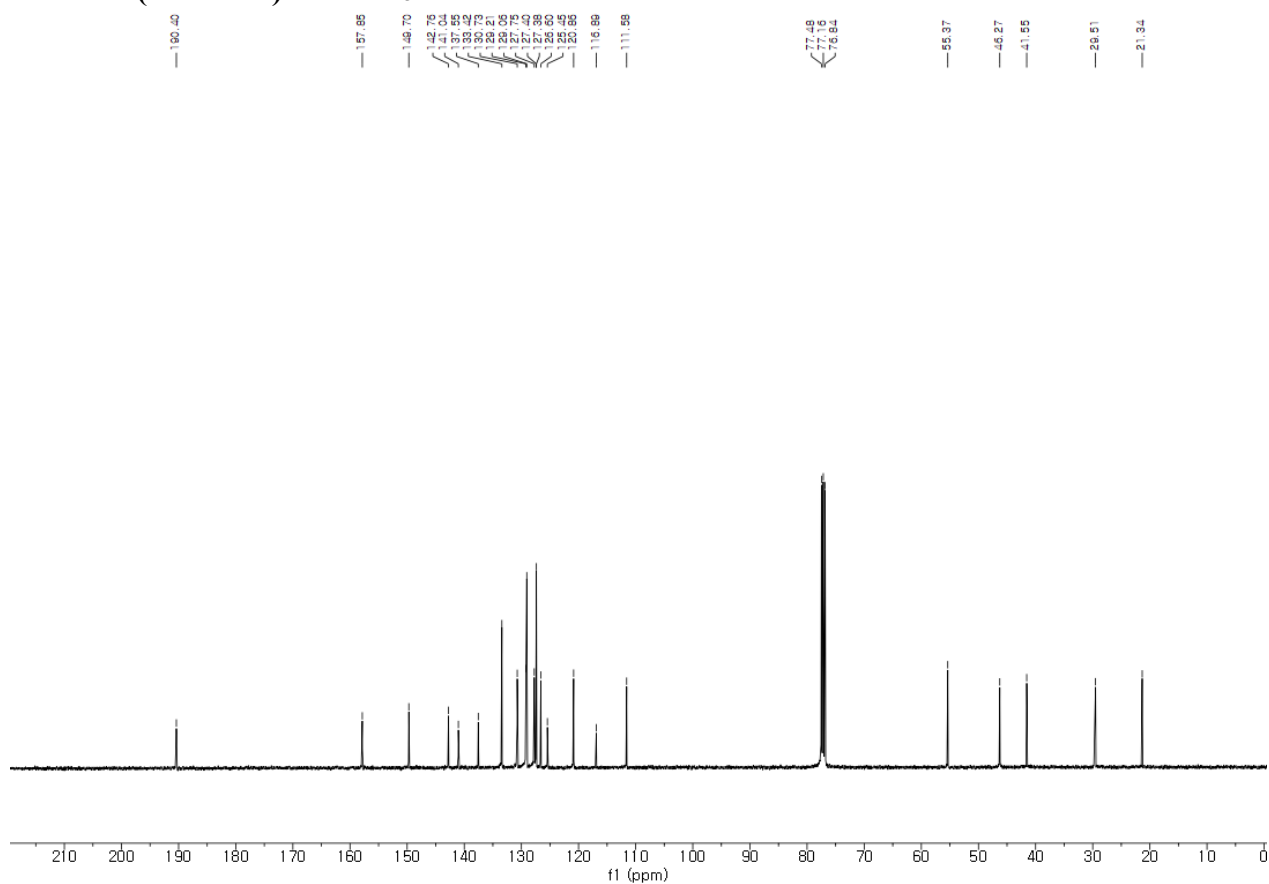
¹H NMR (400 MHz) in CDCl₃

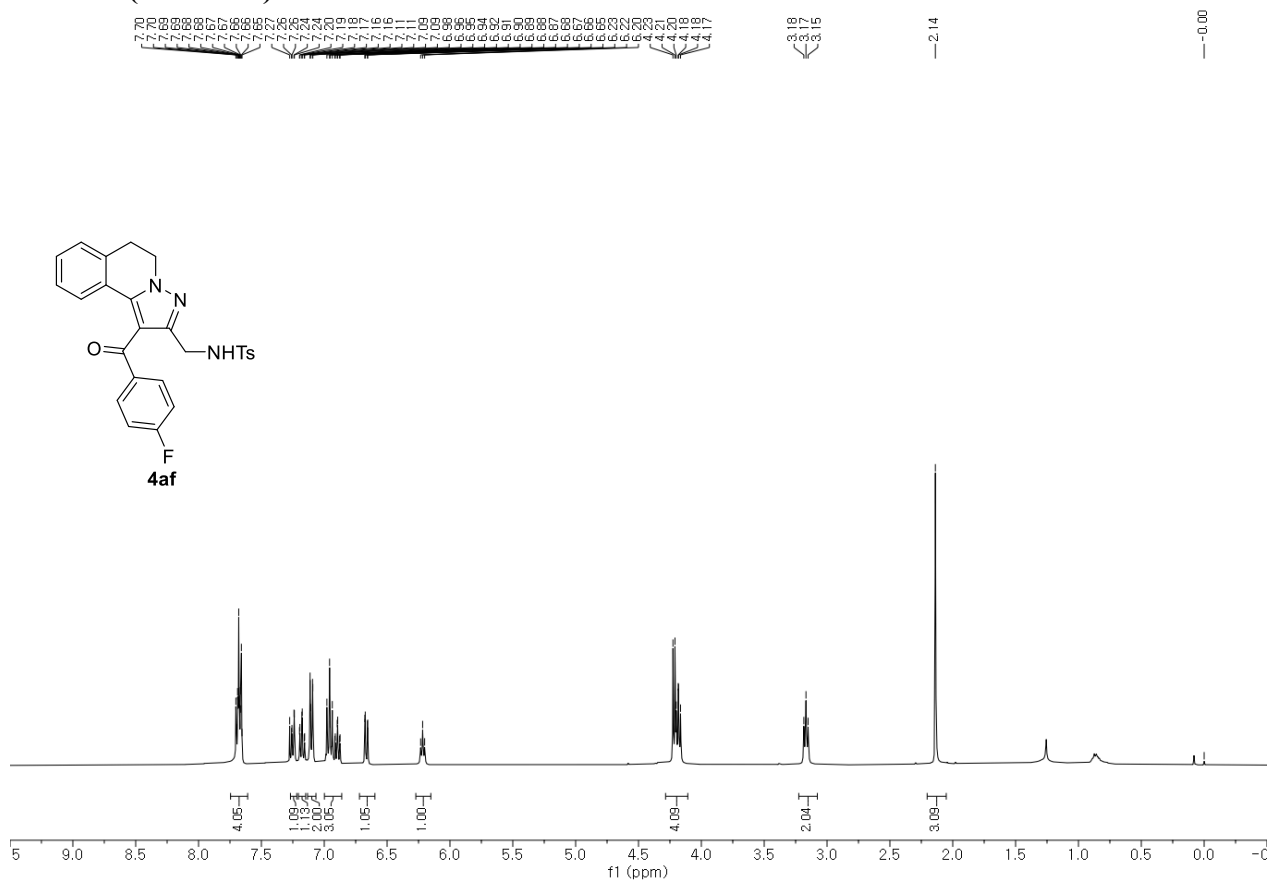
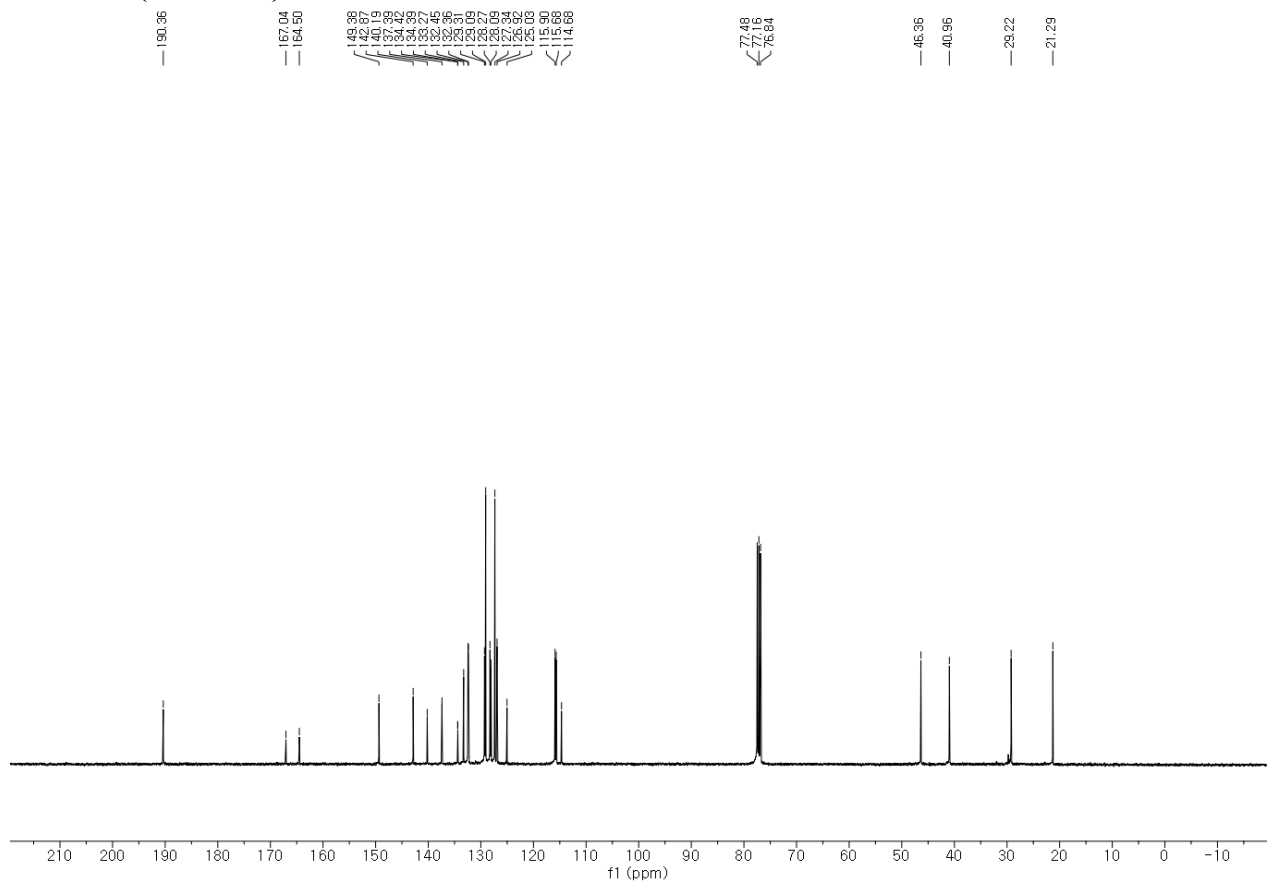


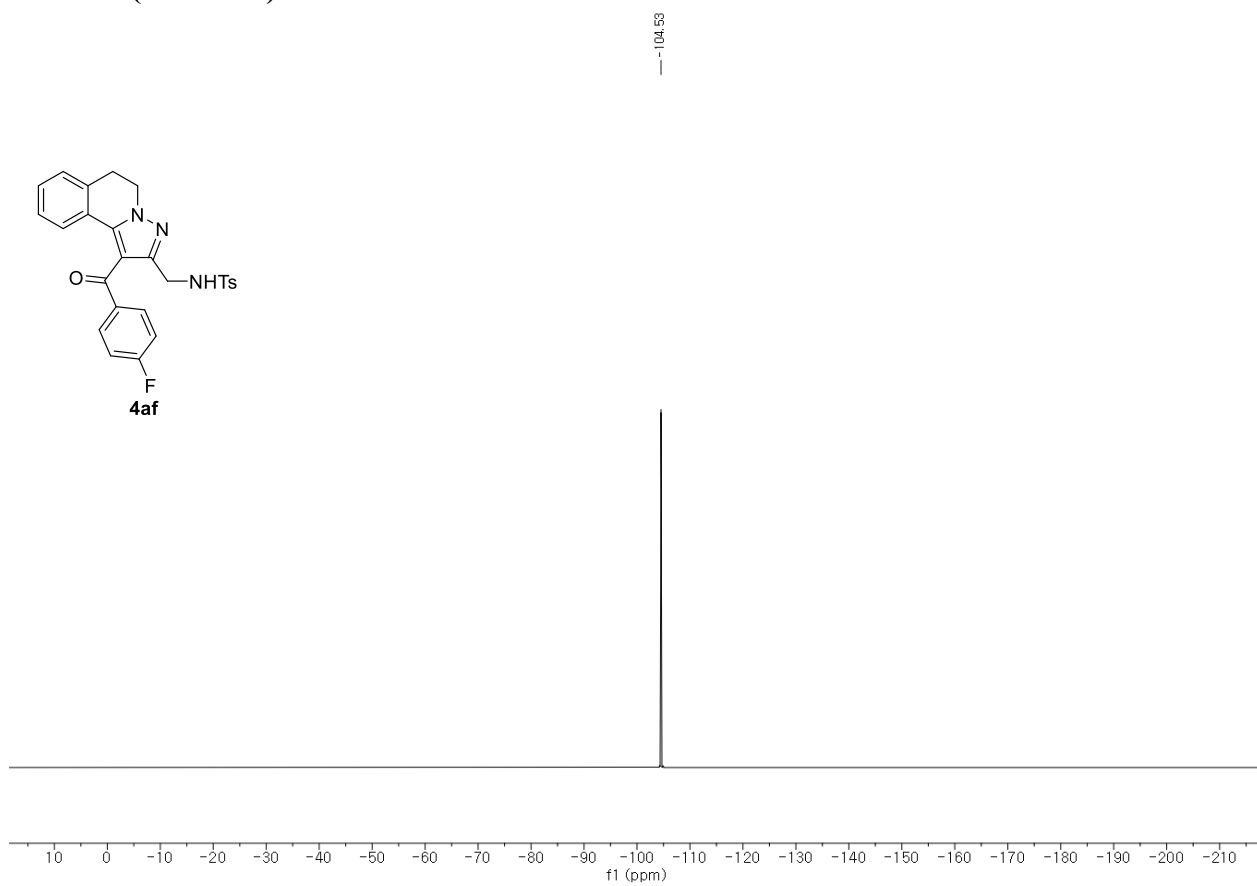
^{13}C NMR (100 MHz) in CDCl_3

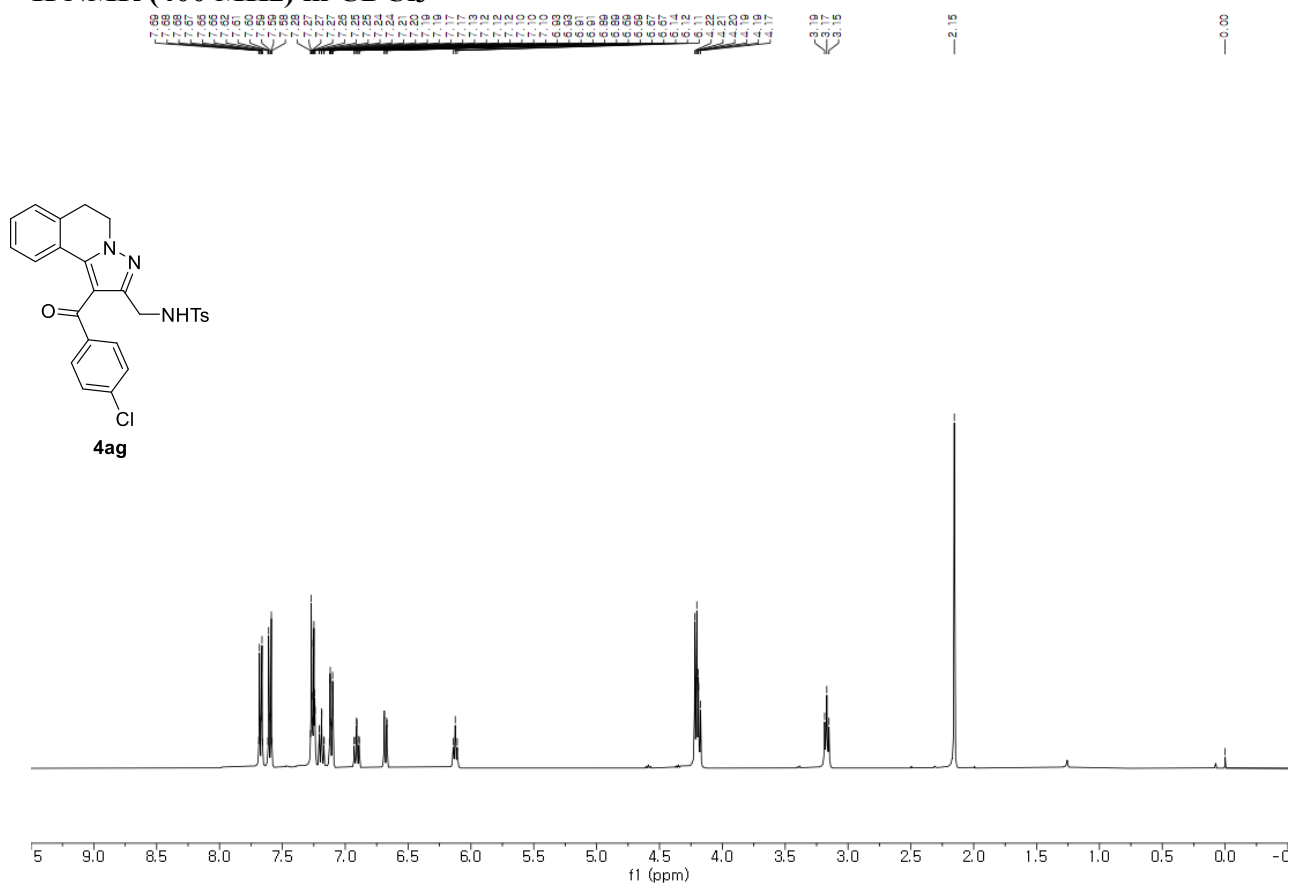
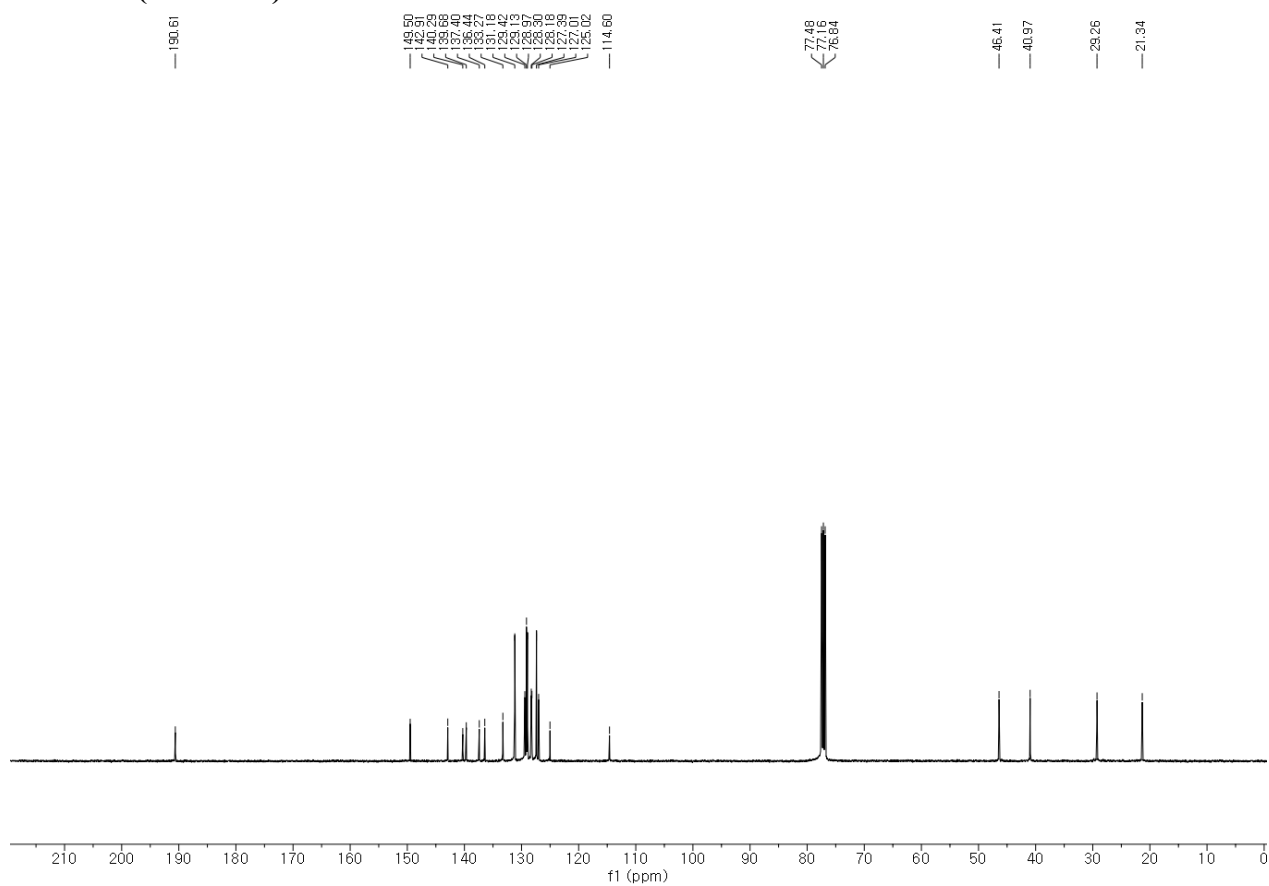


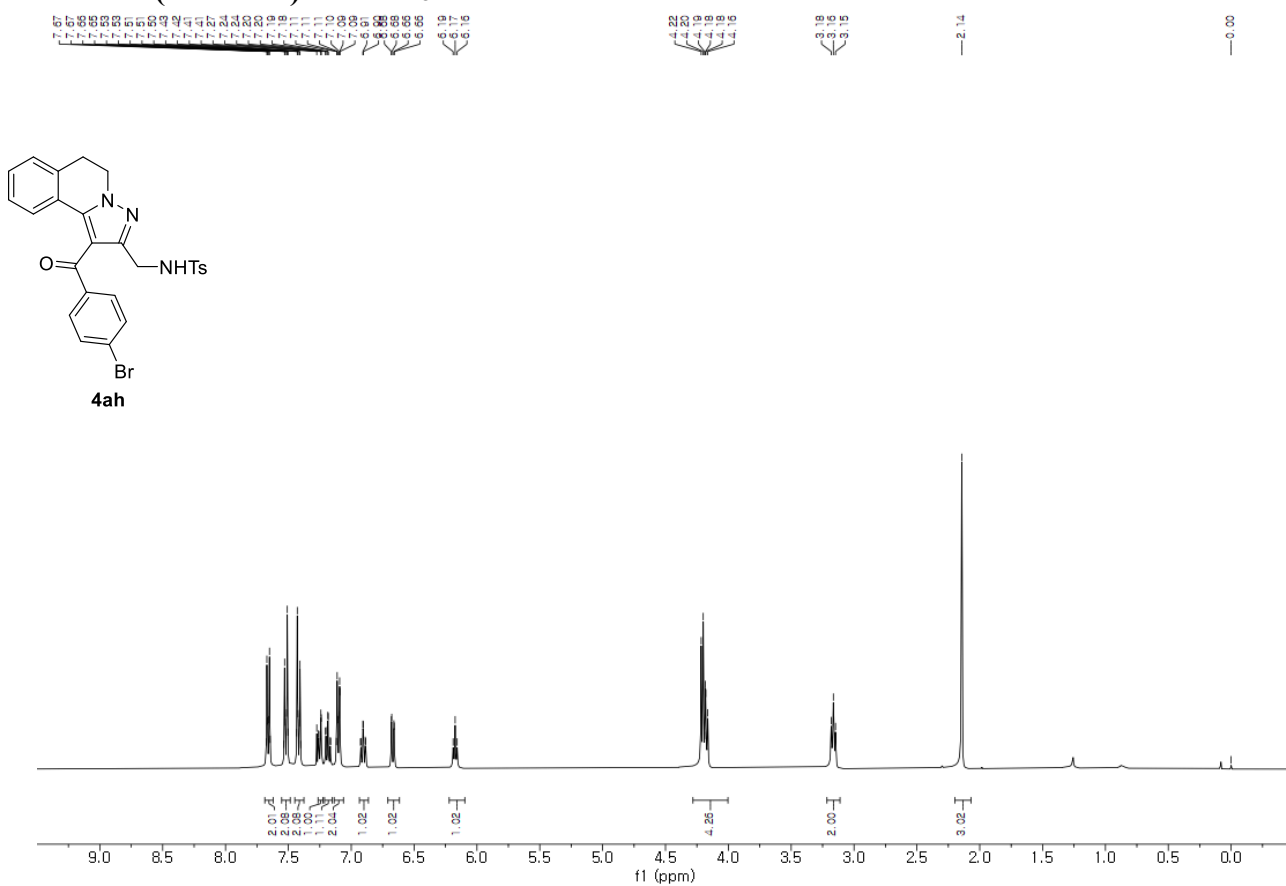
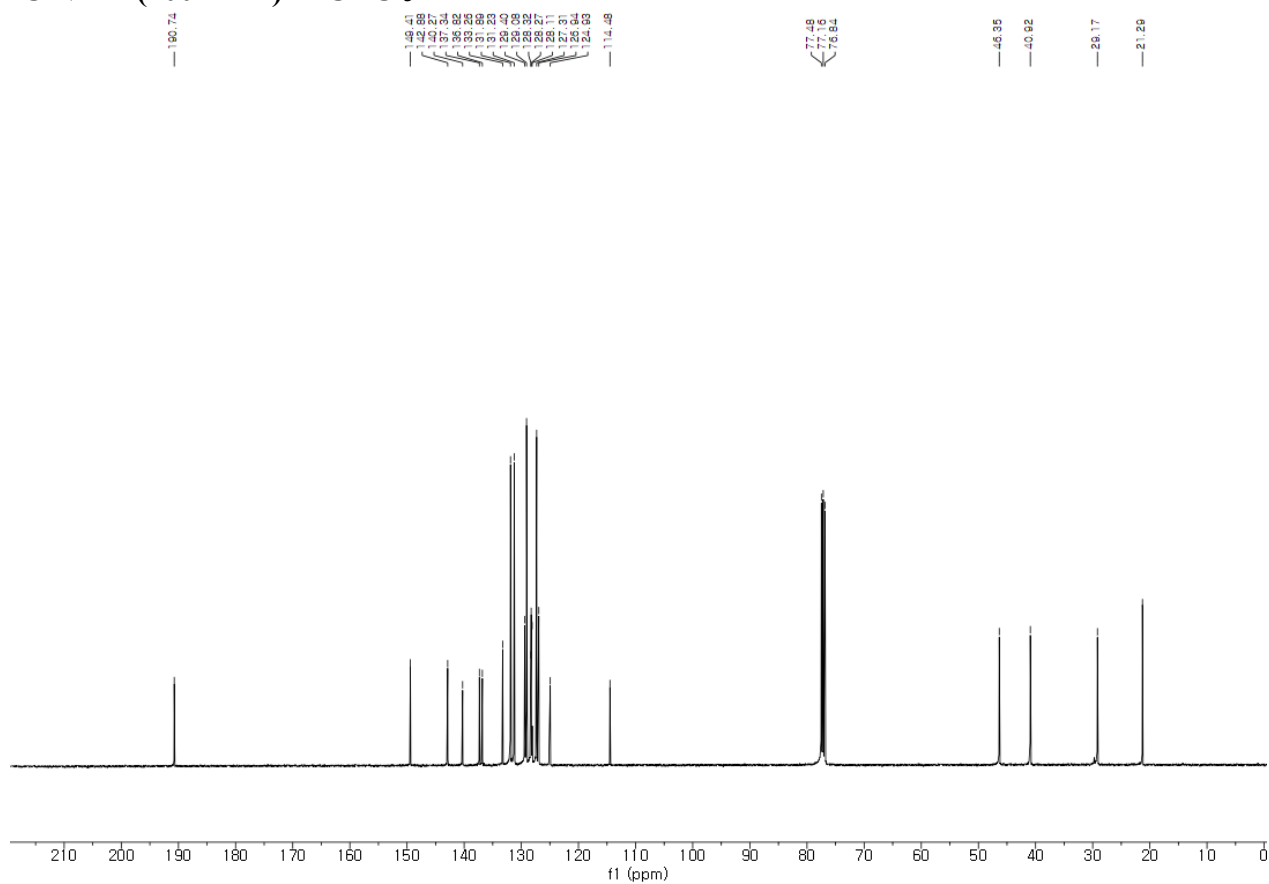
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

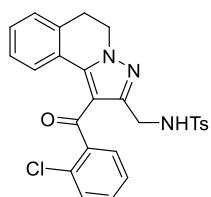
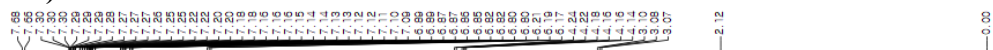
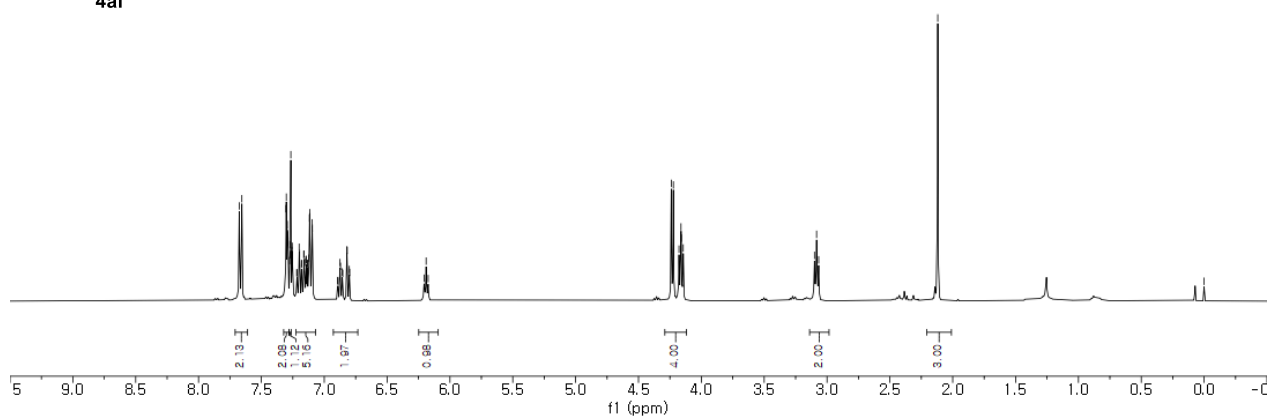
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

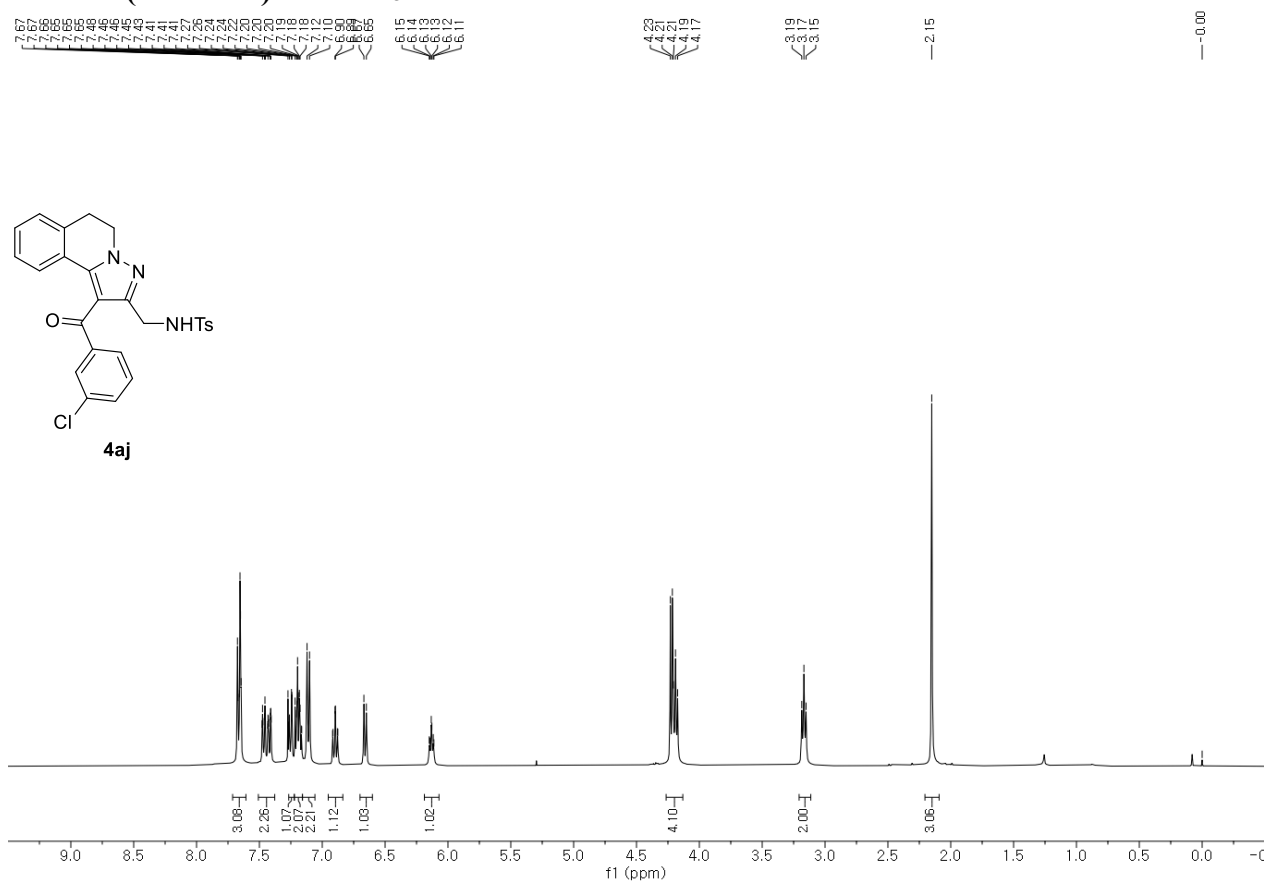
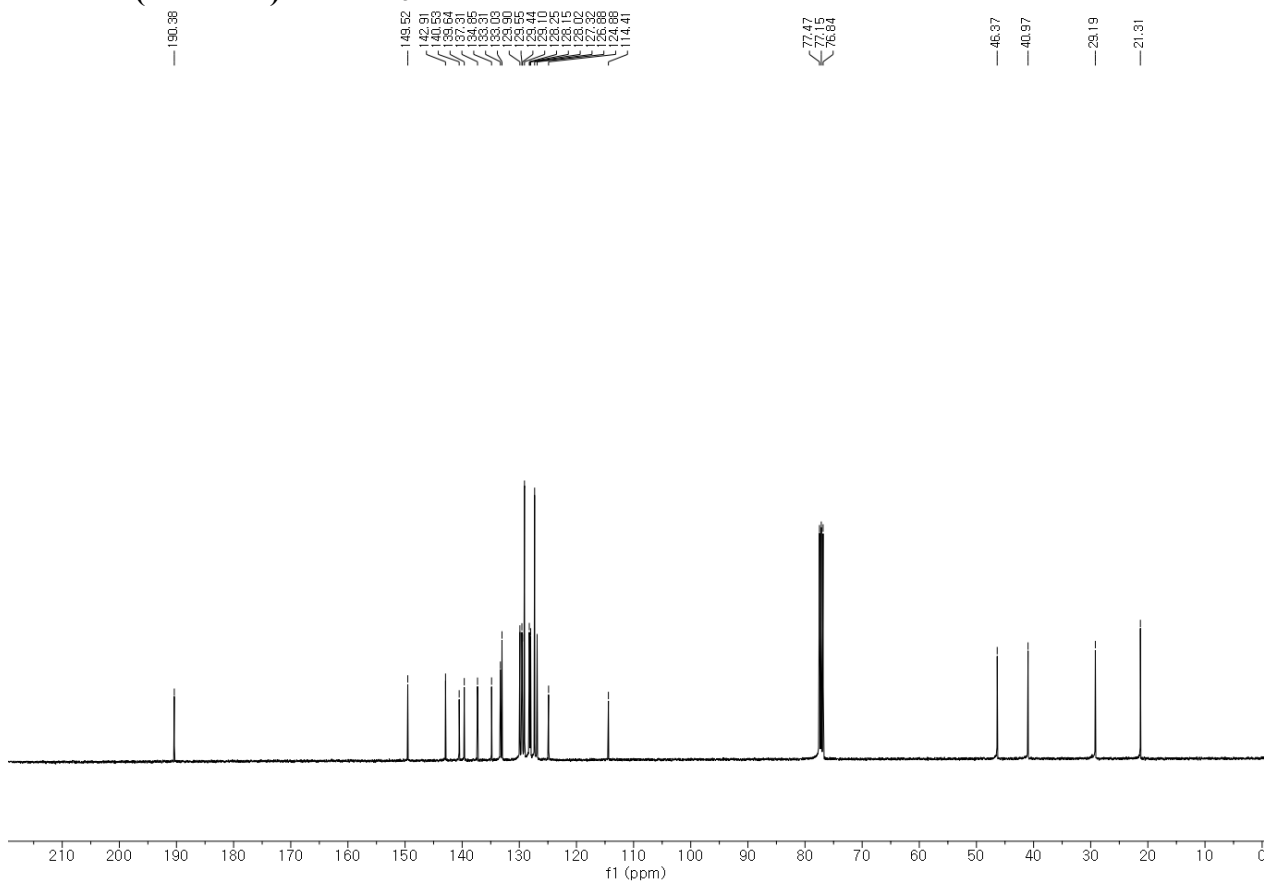
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

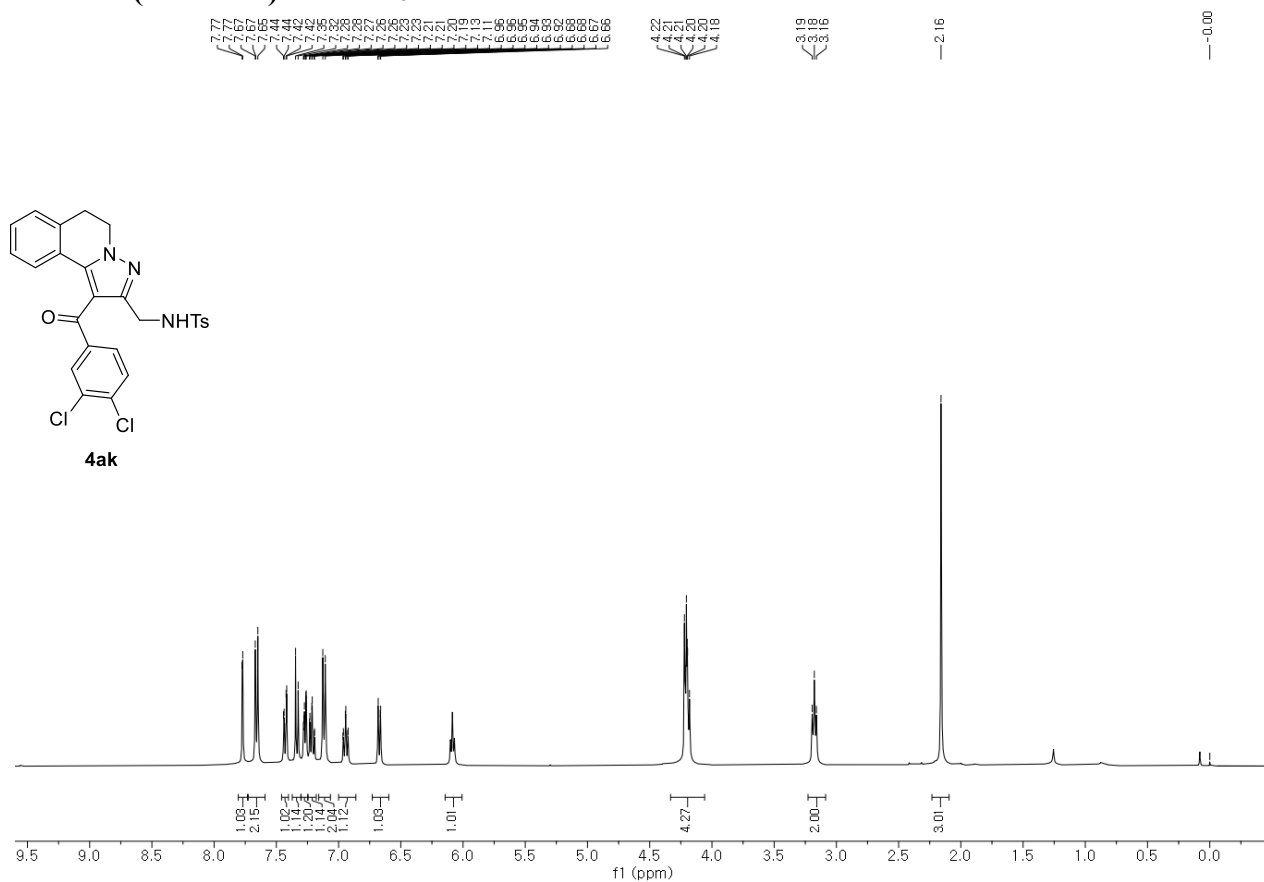
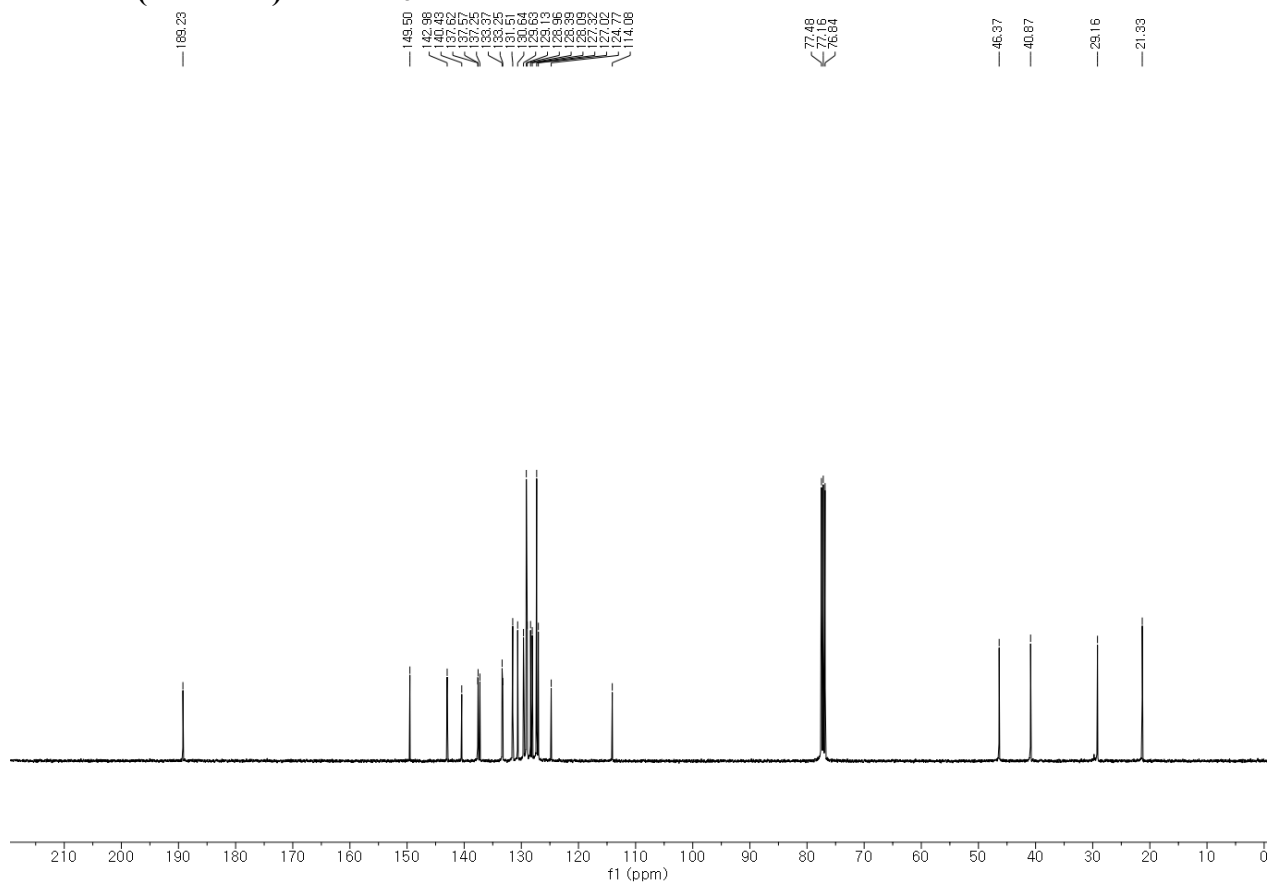
^{19}F NMR (376 MHz) in CDCl_3 

^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

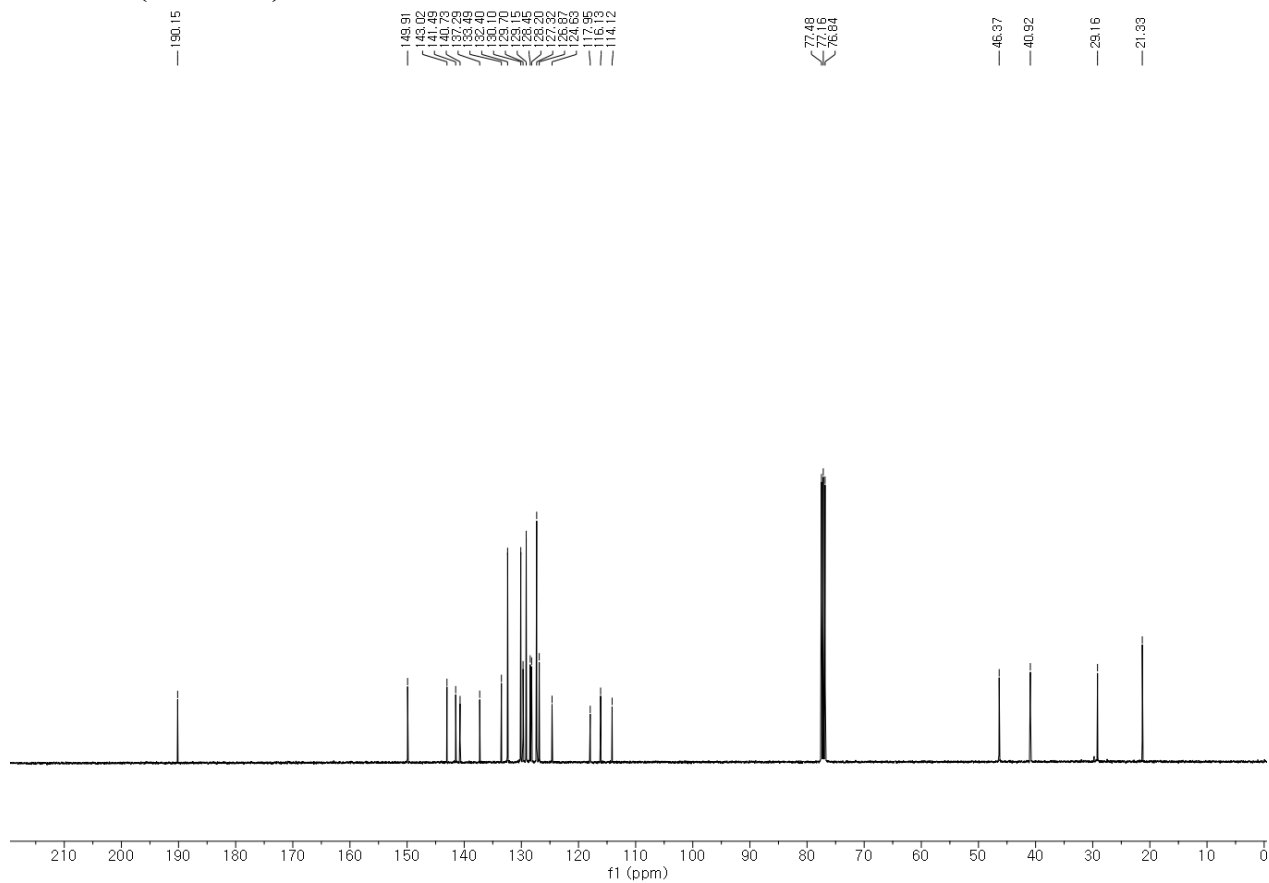
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

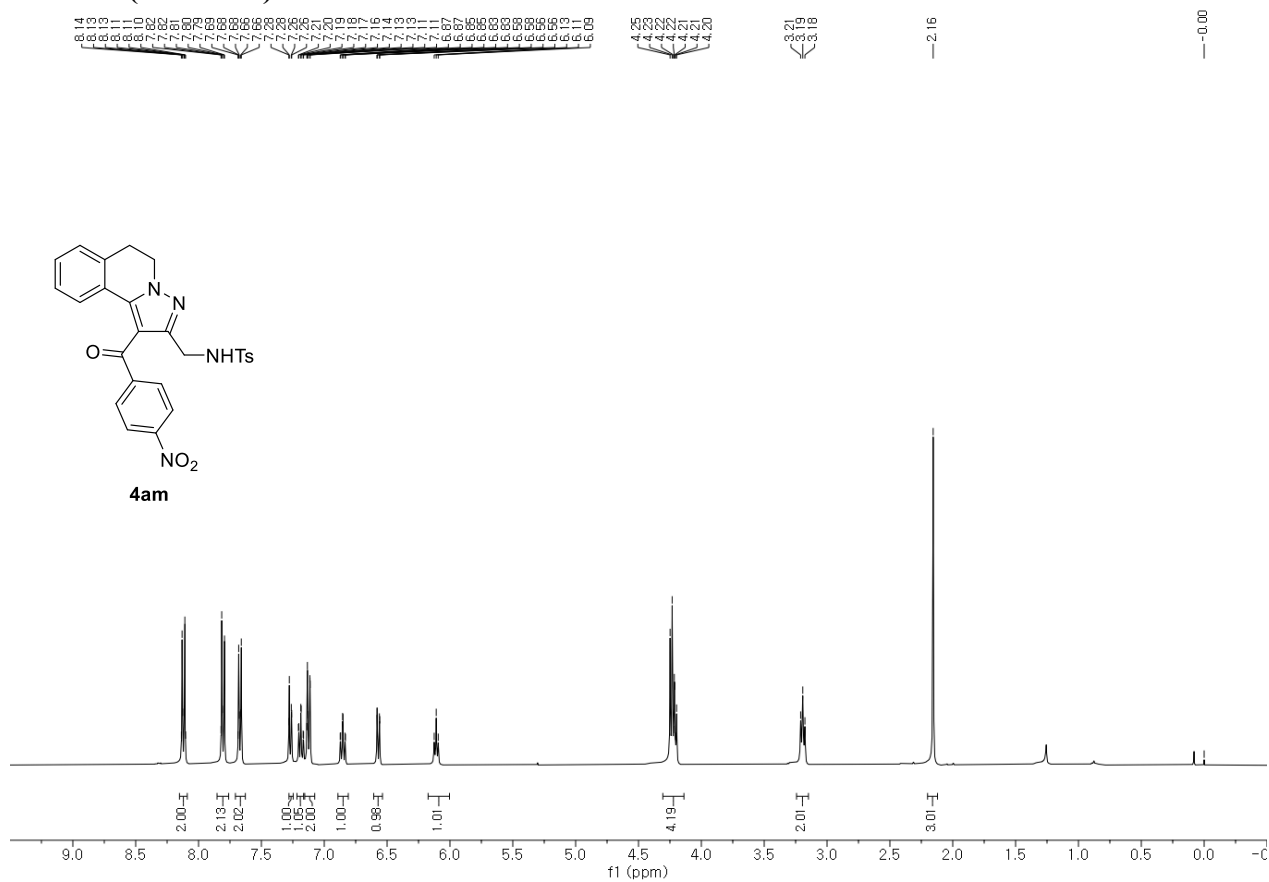
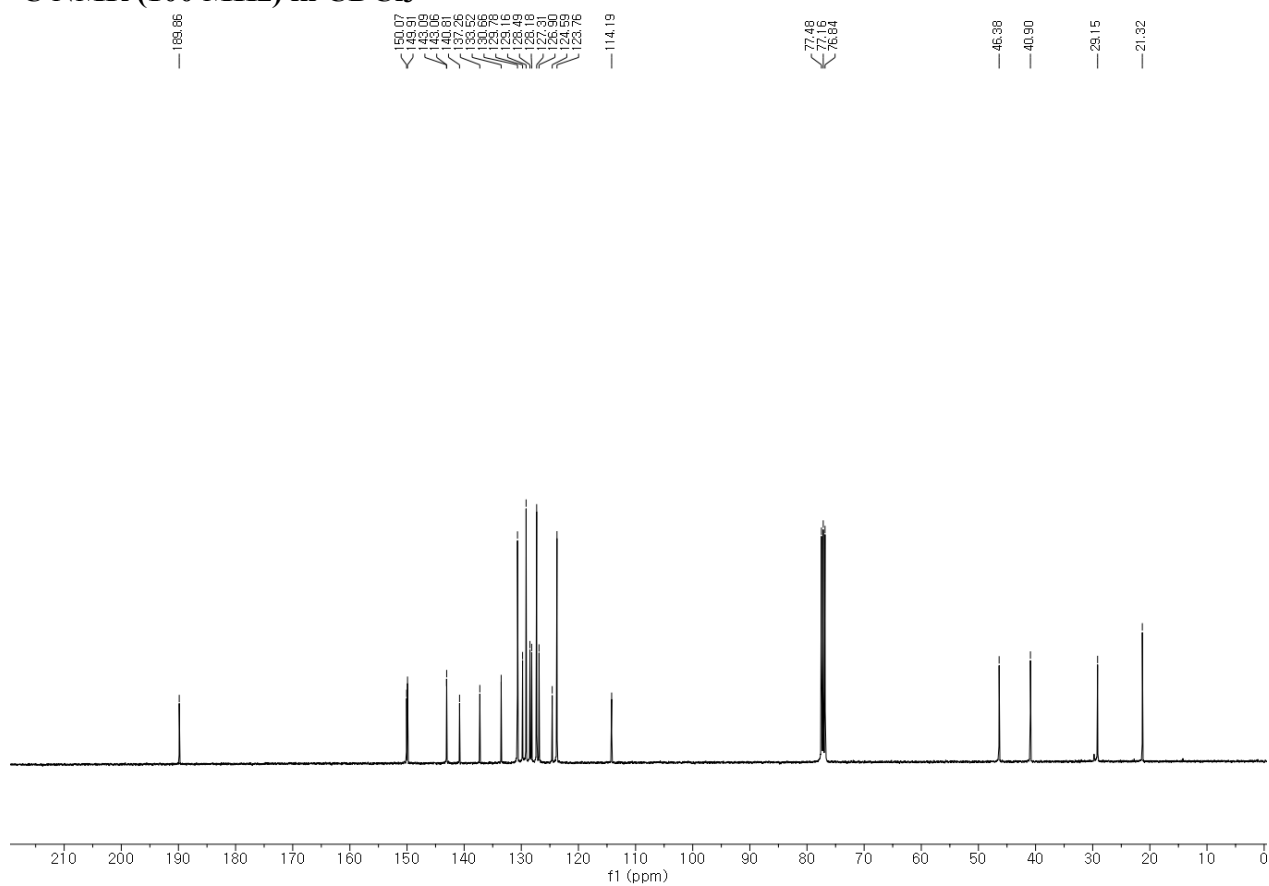
^1H NMR (400 MHz) in CDCl_3 **4ai** **^{13}C NMR (100 MHz) in CDCl_3** 

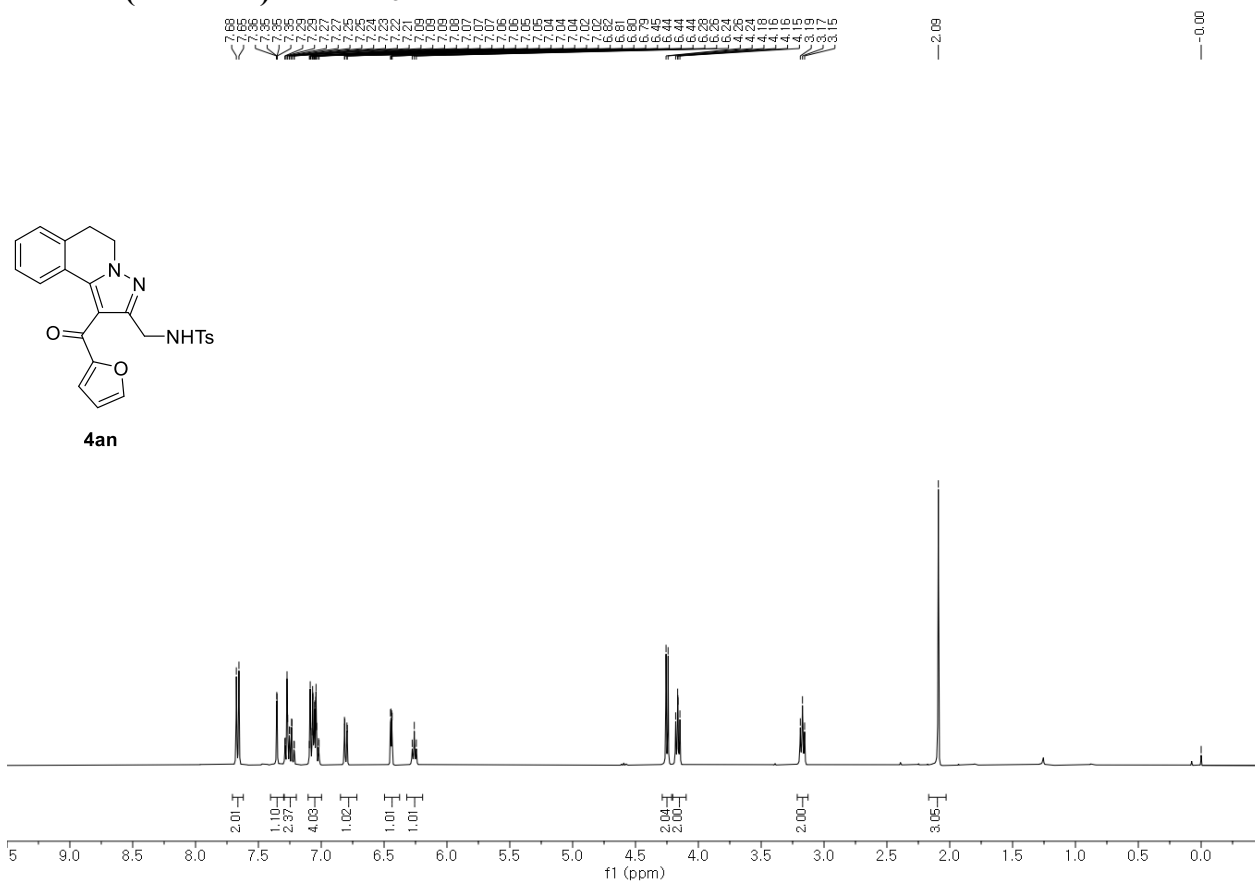
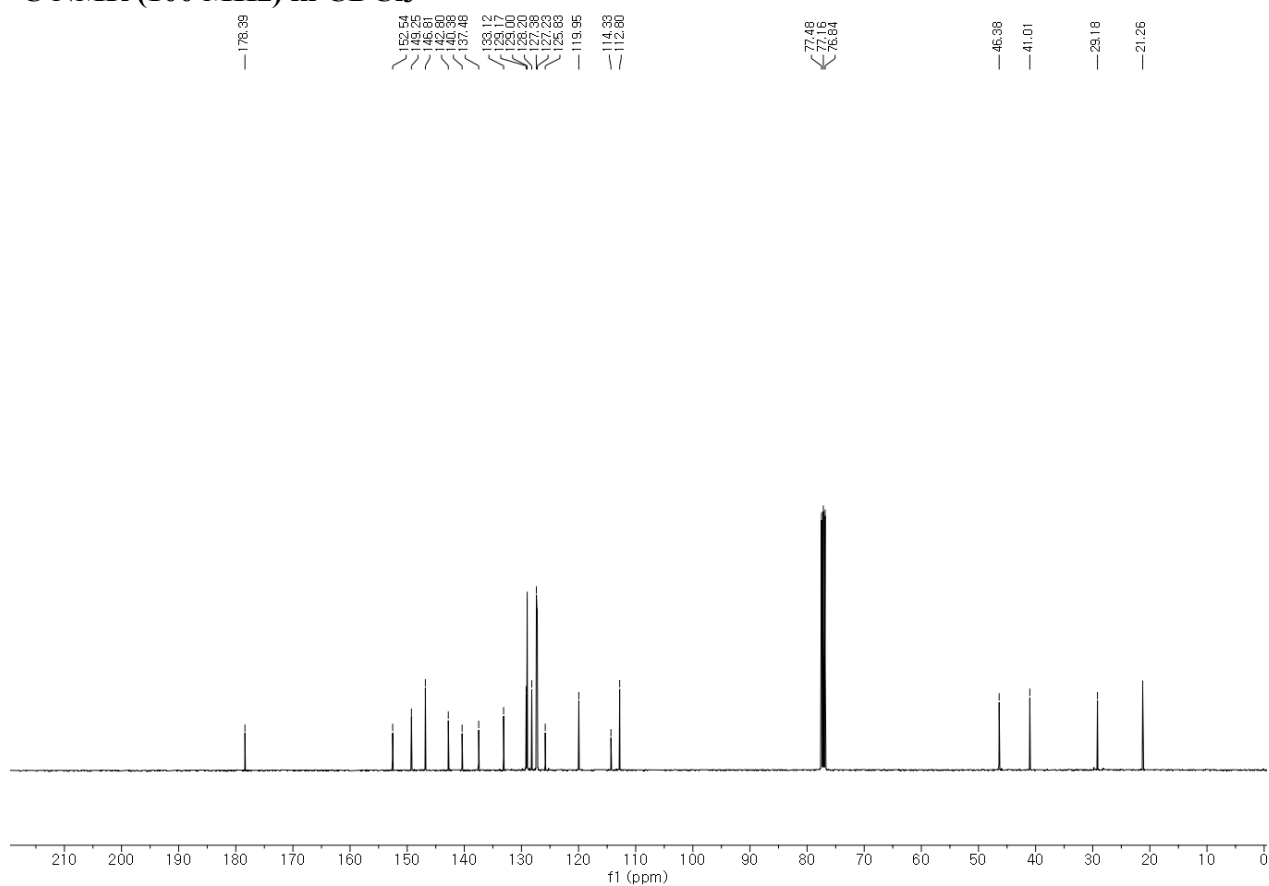
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

¹H NMR (400 MHz) in CDCl₃**¹³C NMR (100 MHz) in CDCl₃**

75
774
774
772
772
768
768
766
759
758
757
728
726
726
722
720
720
718
718
713
713
711
788
686
686
684
684
655
653
653
653
653



^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

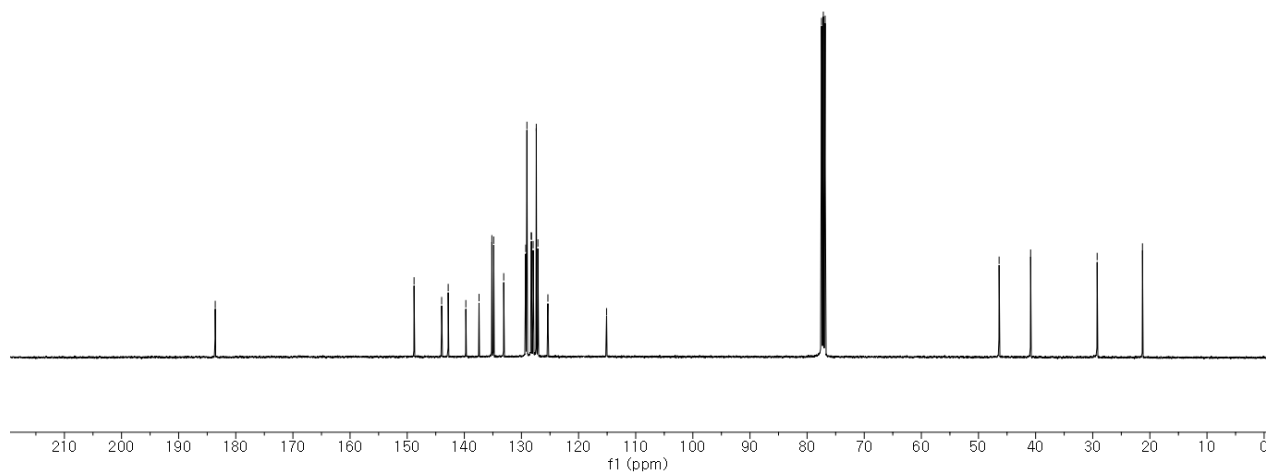
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

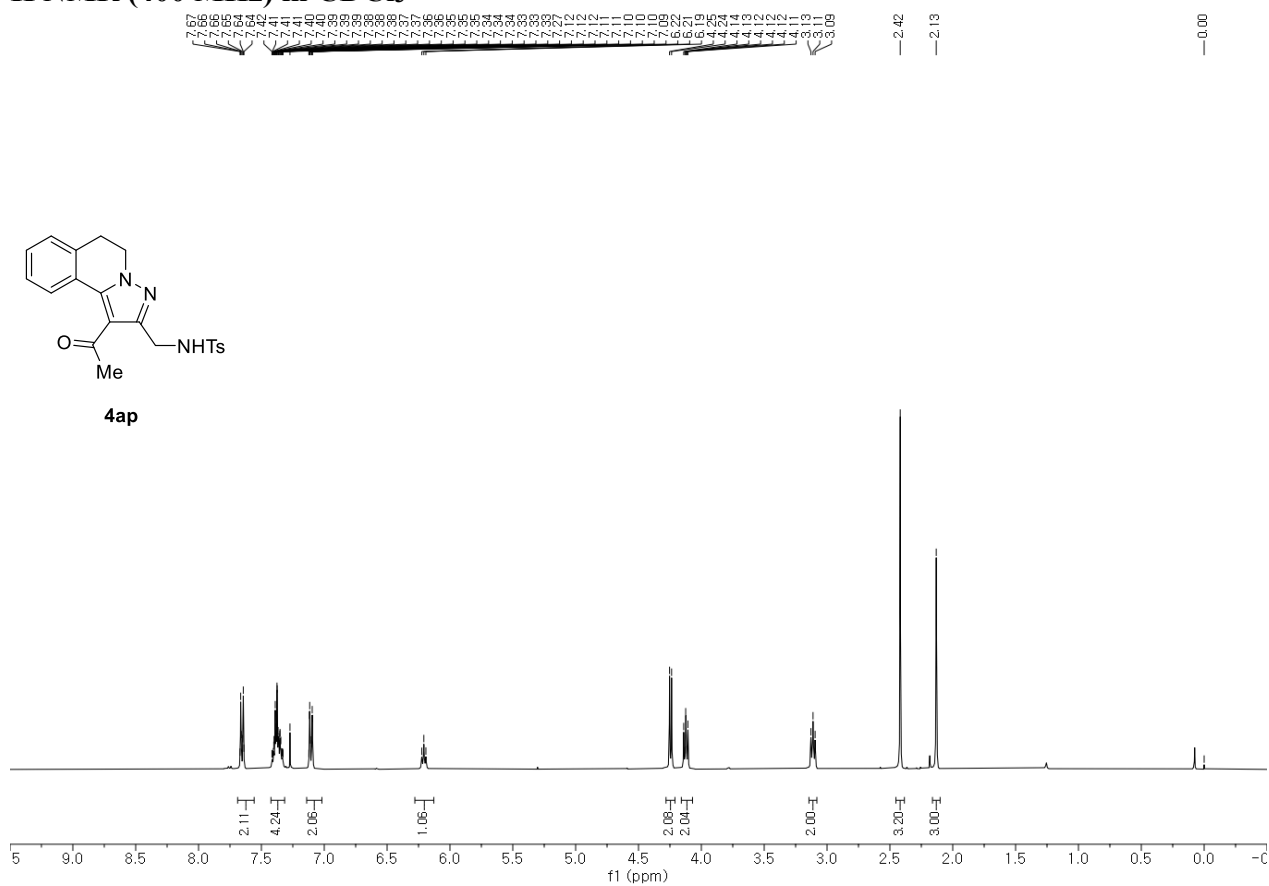
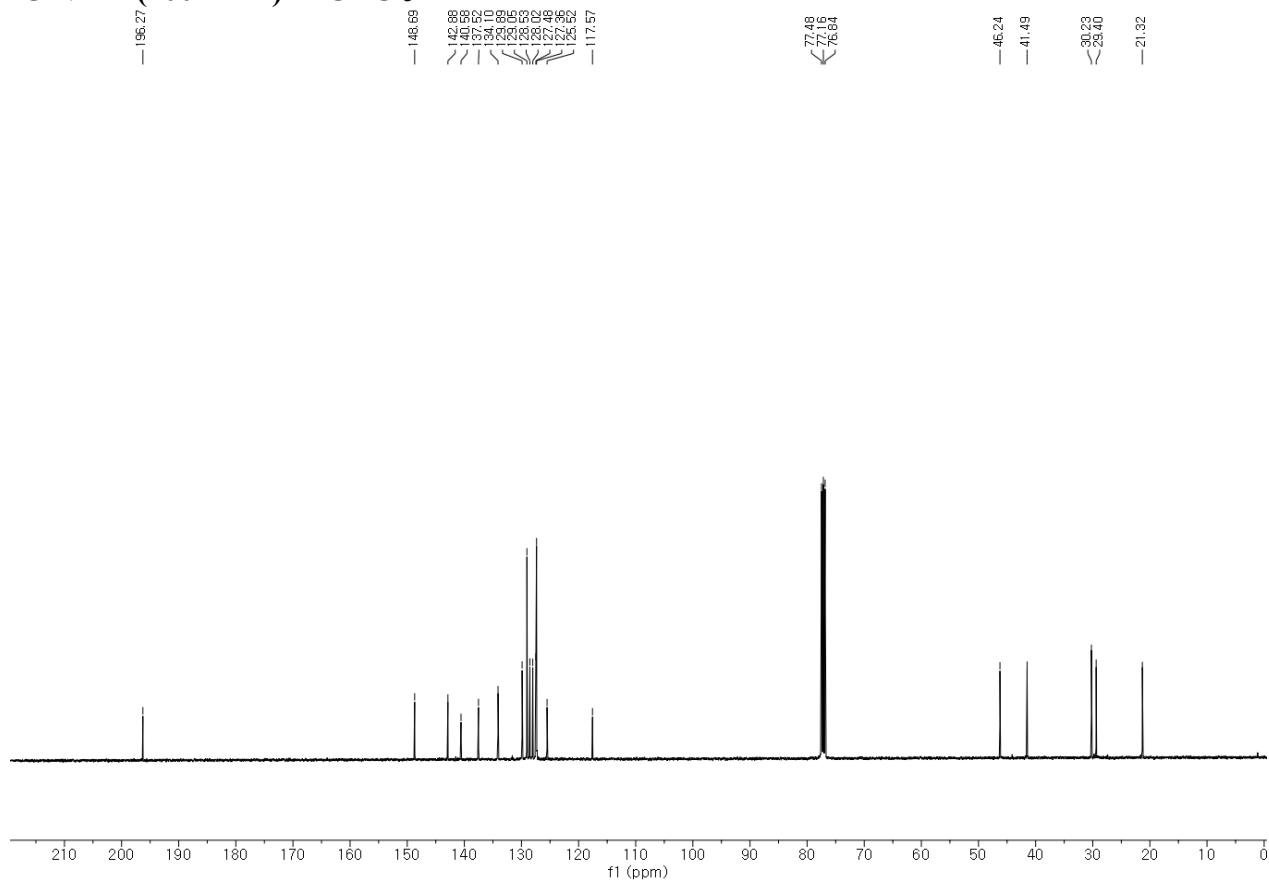
7.68
7.68
7.67
7.66
7.63
7.62
7.61
7.61
7.28
7.27
7.27
7.26
7.26
7.25
7.25
7.23
7.23
7.21
7.19
7.19
7.11
7.10
7.10
7.09
7.08
7.08
7.07
7.03
7.02
7.01
7.00
6.99
6.94
6.93
6.92
6.90
6.89
6.89
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4.23
4.19
4.17
4.17
4.15
3.97
3.95

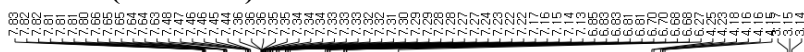
4ao

¹H NMR spectrum (CDCl₃) of compound **4ao**. The x-axis represents the chemical shift in ppm, ranging from 0.0 to 10.0. The spectrum shows several peaks: a multiplet between 7.0 and 7.6 ppm, a doublet at approximately 6.1 ppm, a multiplet at approximately 4.2 ppm, a multiplet at approximately 3.1 ppm, a singlet at approximately 2.1 ppm, a singlet at approximately 1.2 ppm, and a reference peak at 0.0 ppm (TMS).

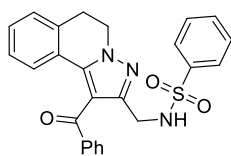
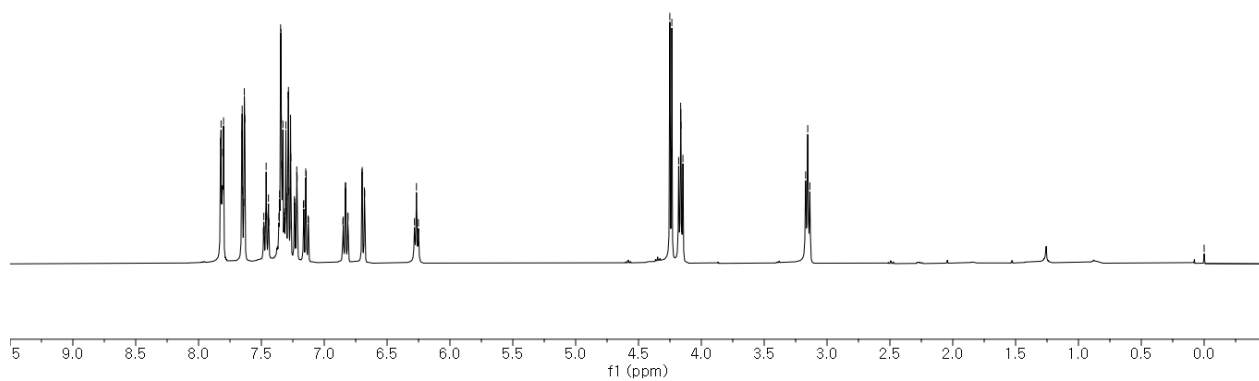
180.60	46.80	77.48
181.60	47.80	77.16
182.60	48.80	76.84
183.60	49.80	46.39
184.60	50.80	40.87
185.60	51.80	29.23
186.60	52.80	21.29



¹H NMR (400 MHz) in CDCl₃**¹³C NMR (100 MHz) in CDCl₃**

^1H NMR (400 MHz) in CDCl_3 

0.00

**4aq** **^{13}C NMR (100 MHz) in CDCl_3**

192.14

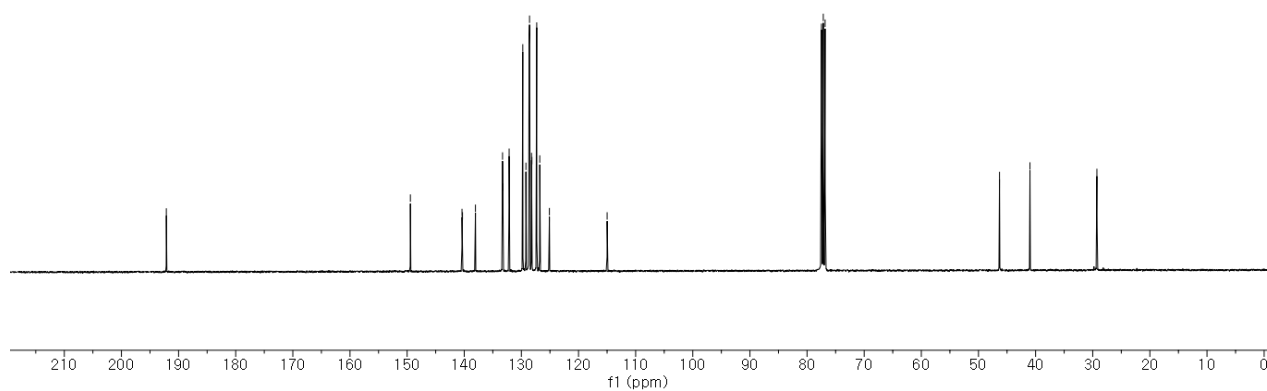
149.43

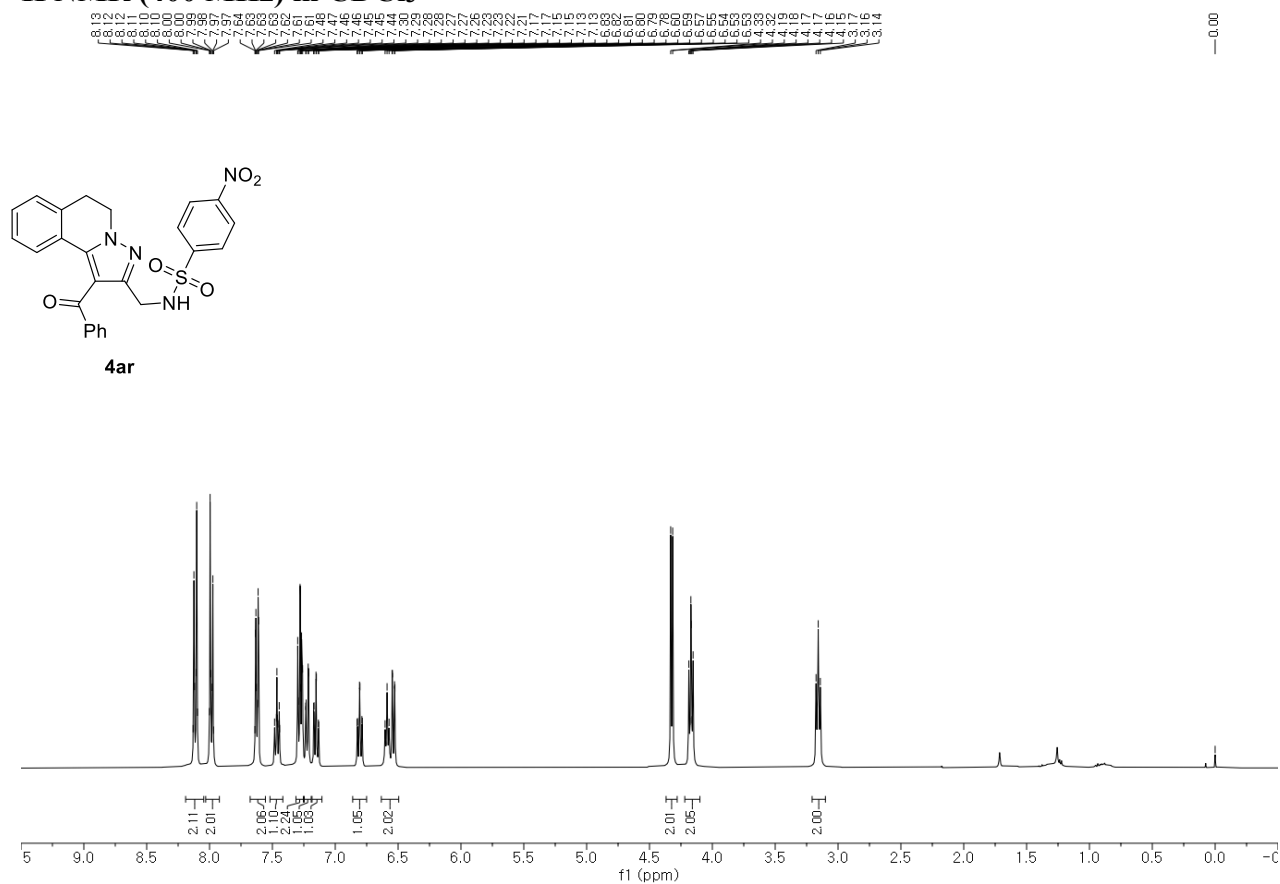
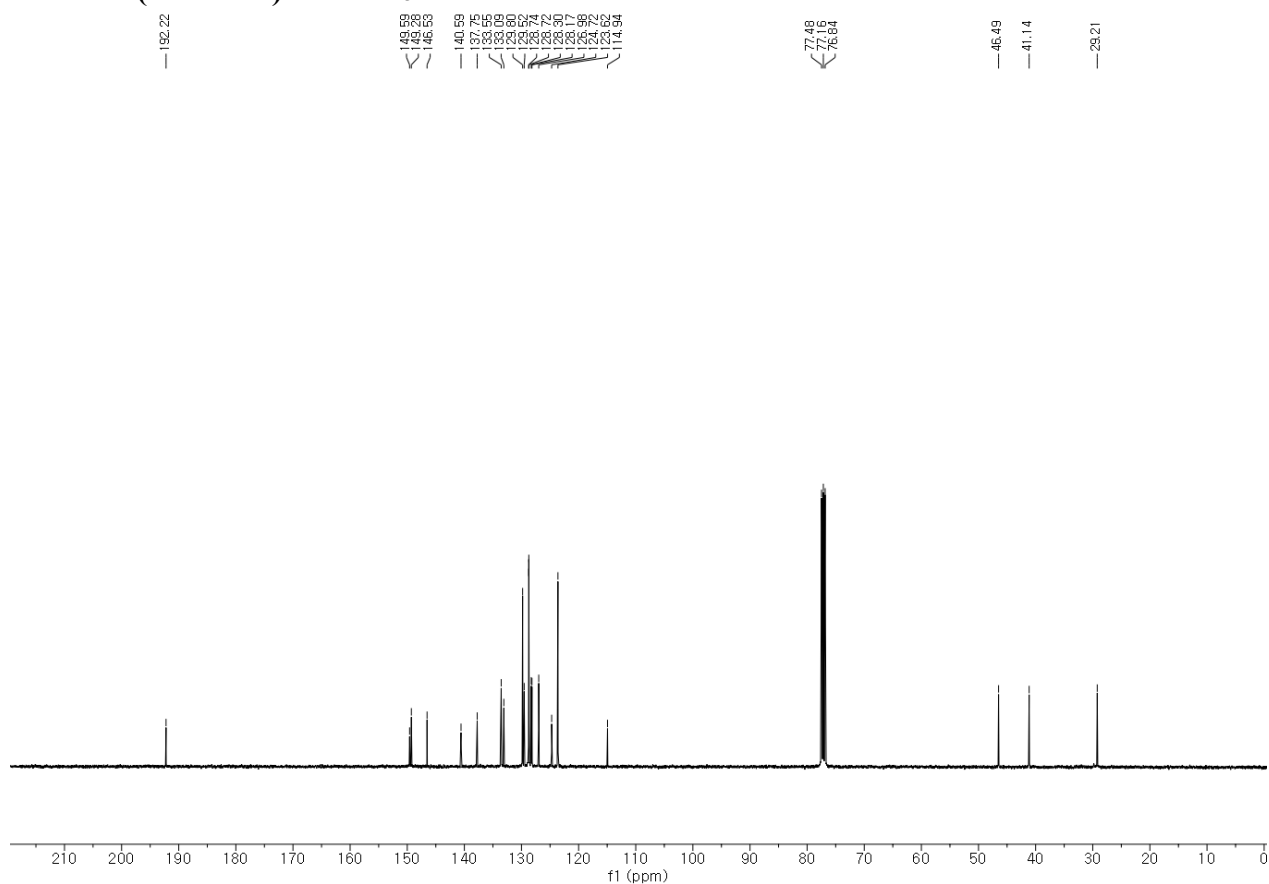
140.39
140.31
138.04
135.05
132.14
129.42
128.56
128.03
127.77
126.95
126.09
114.1477.48
77.15
76.84

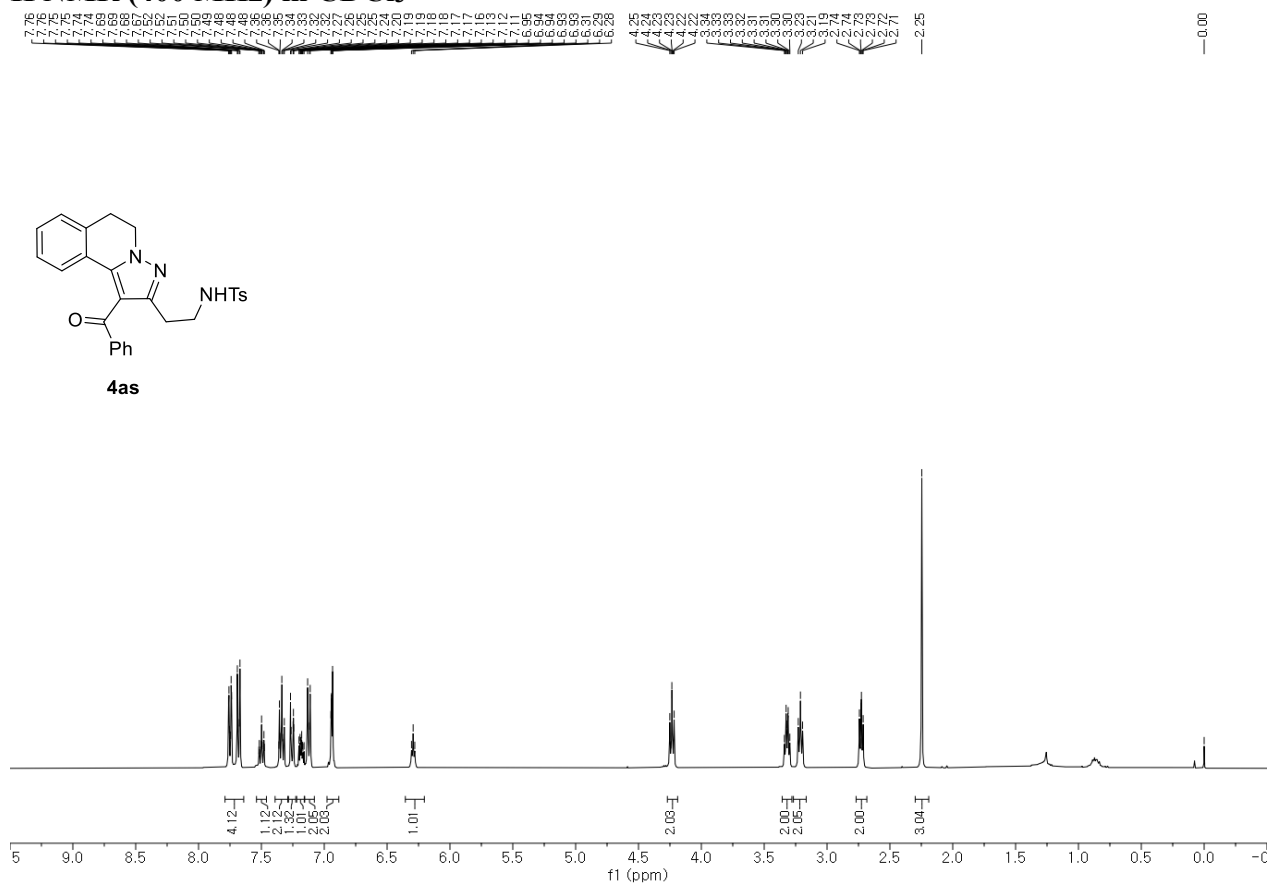
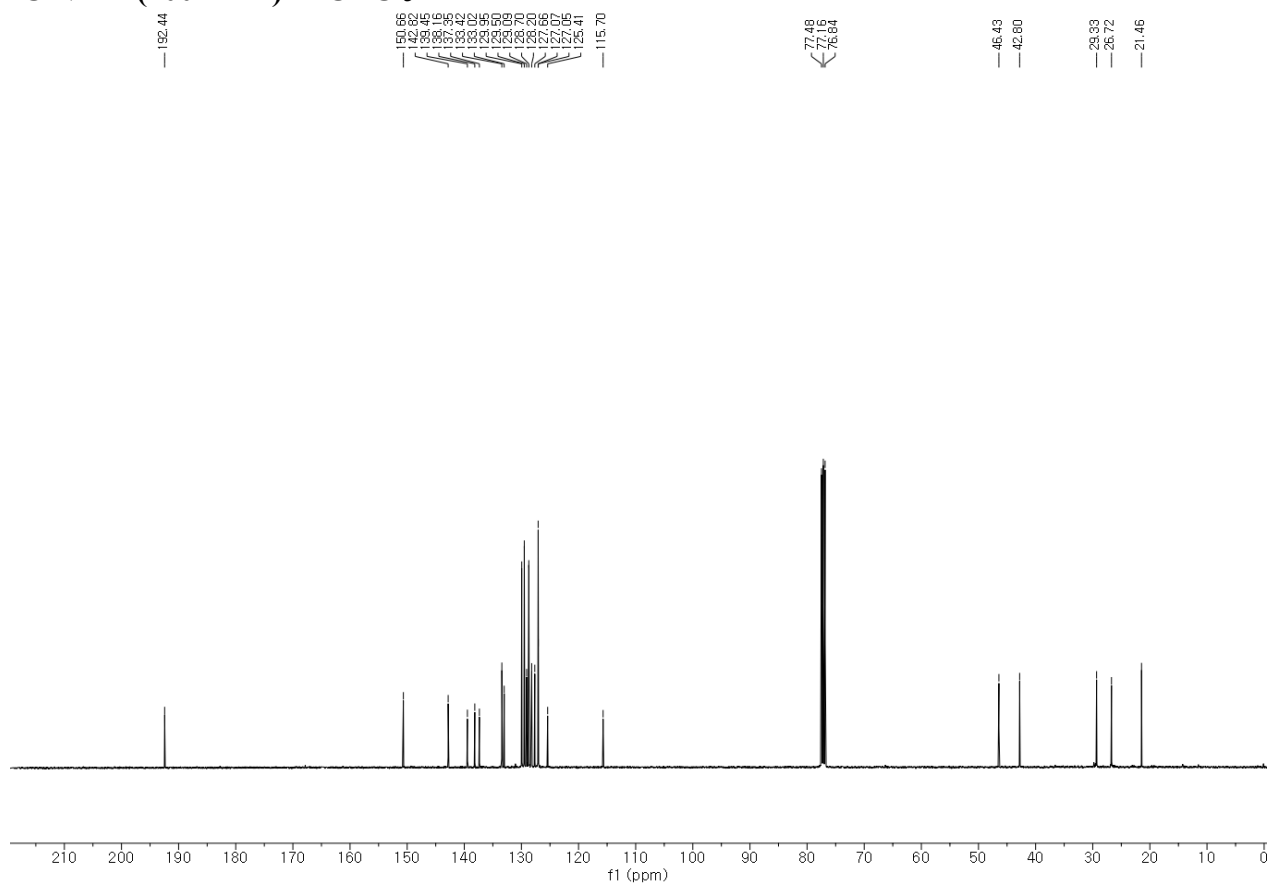
46.32

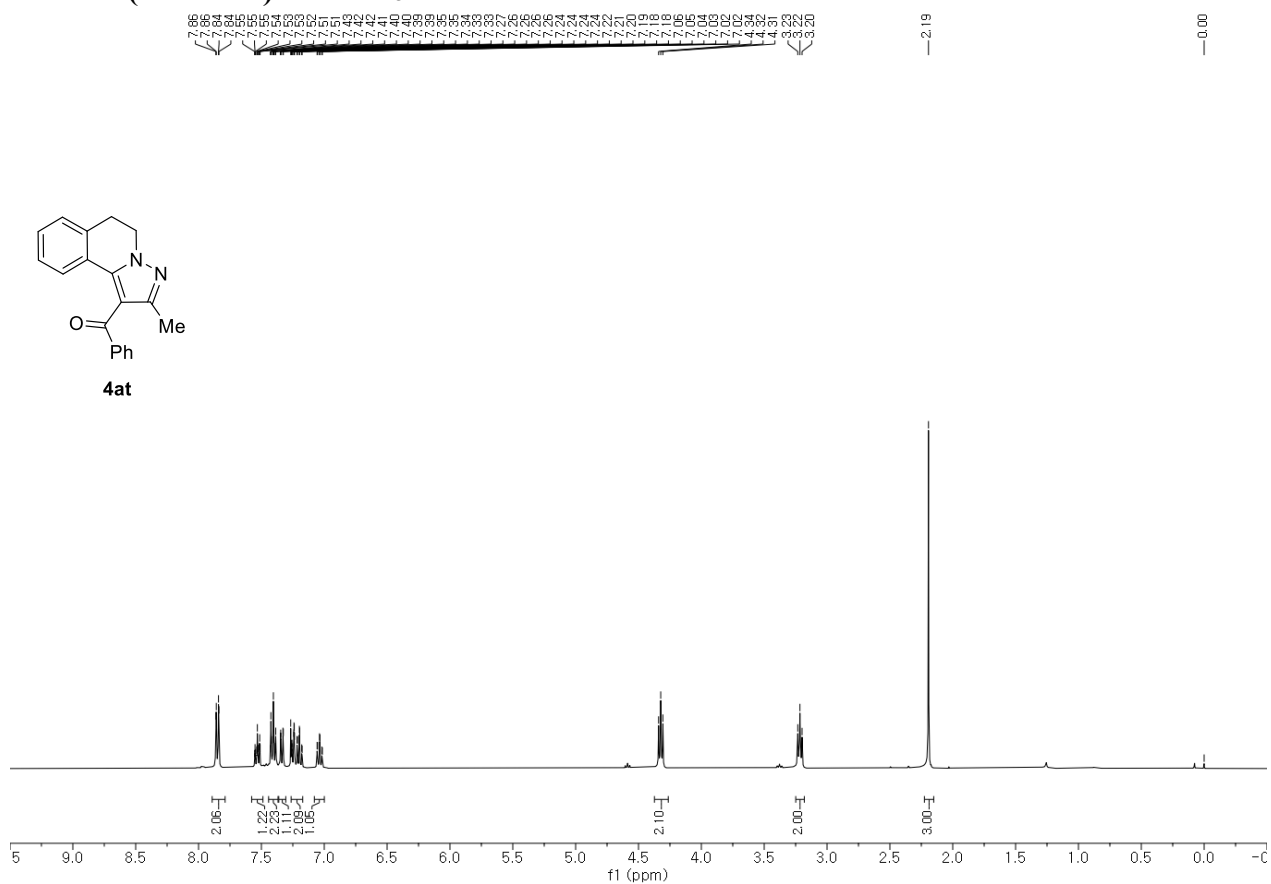
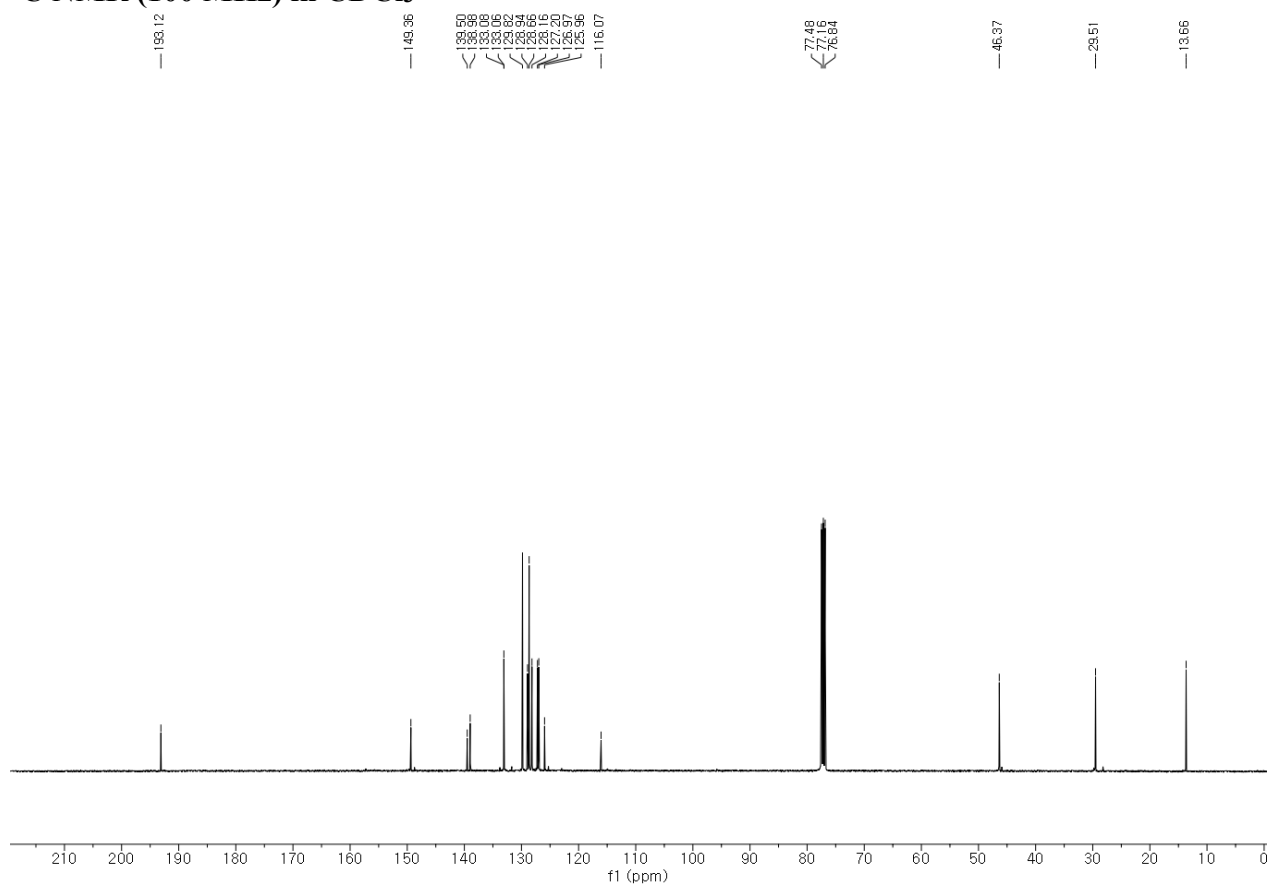
40.99

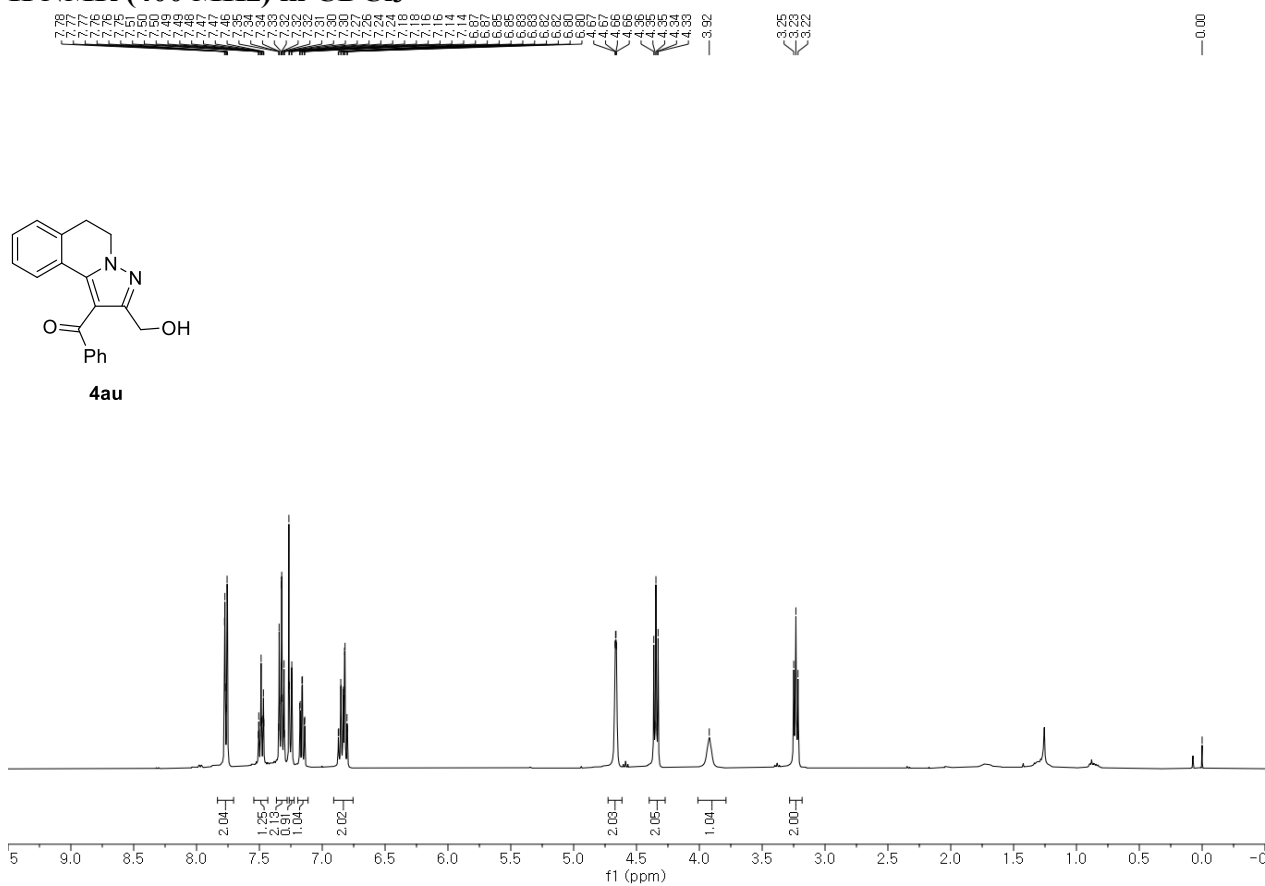
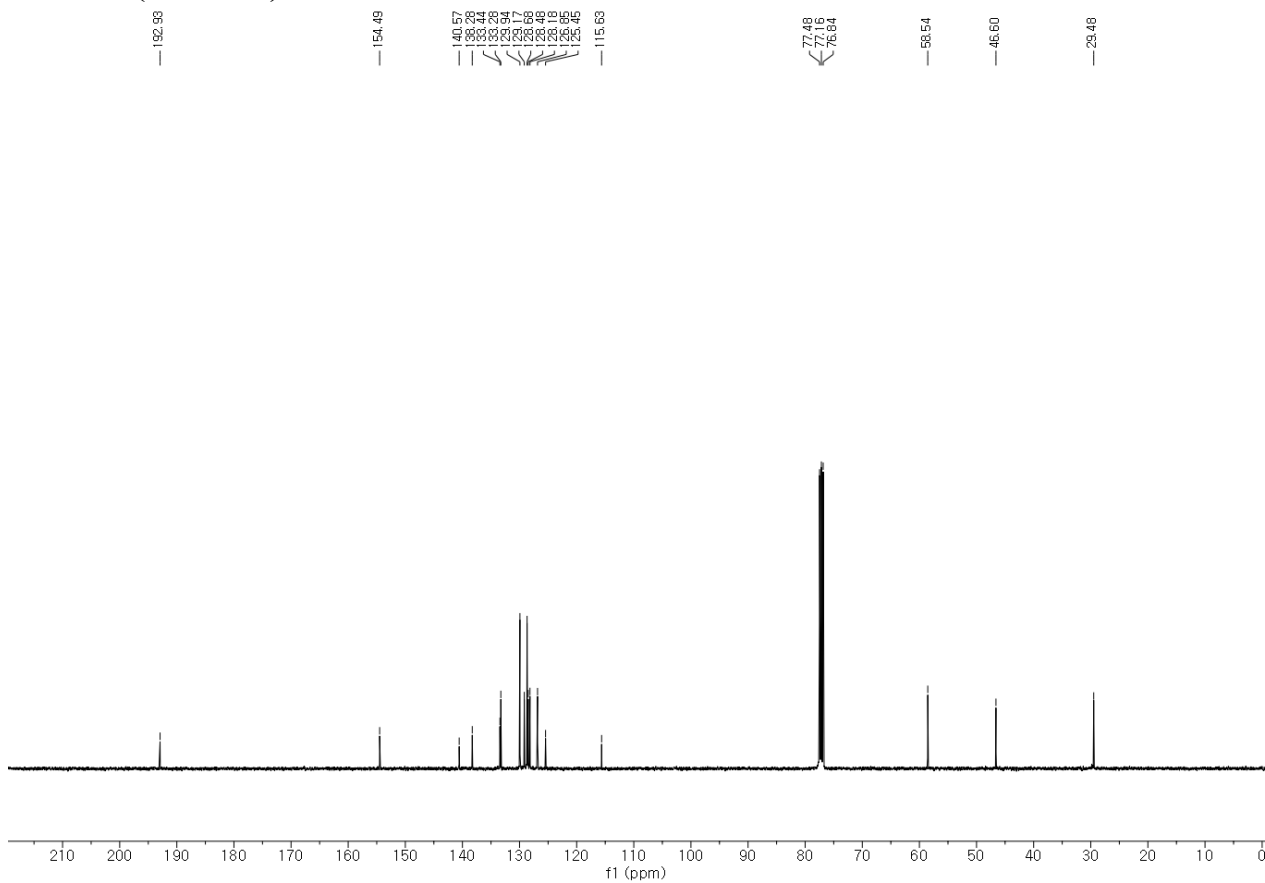
29.27



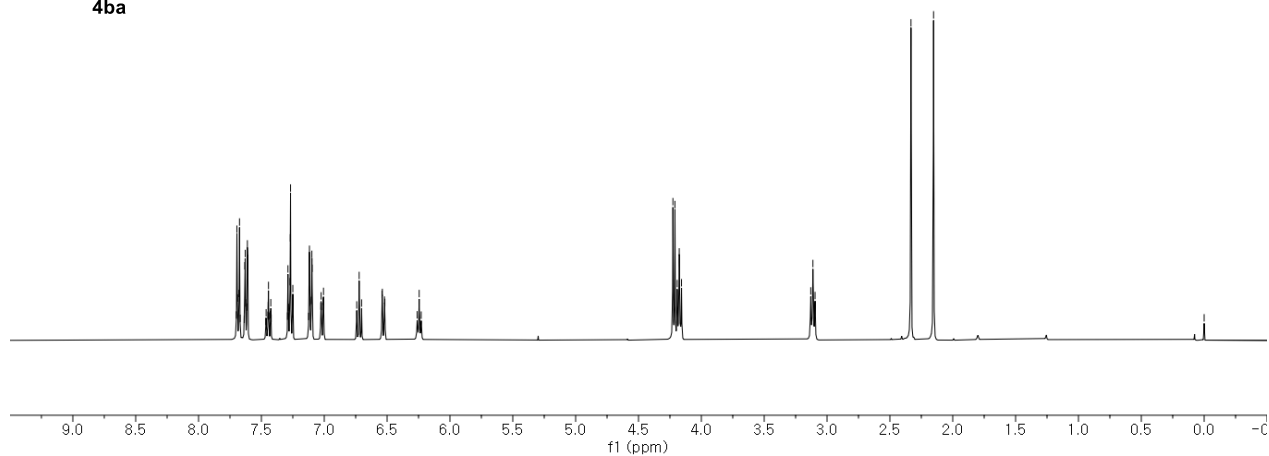
¹H NMR (400 MHz) in CDCl₃**¹³C NMR (100 MHz) in CDCl₃**

^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

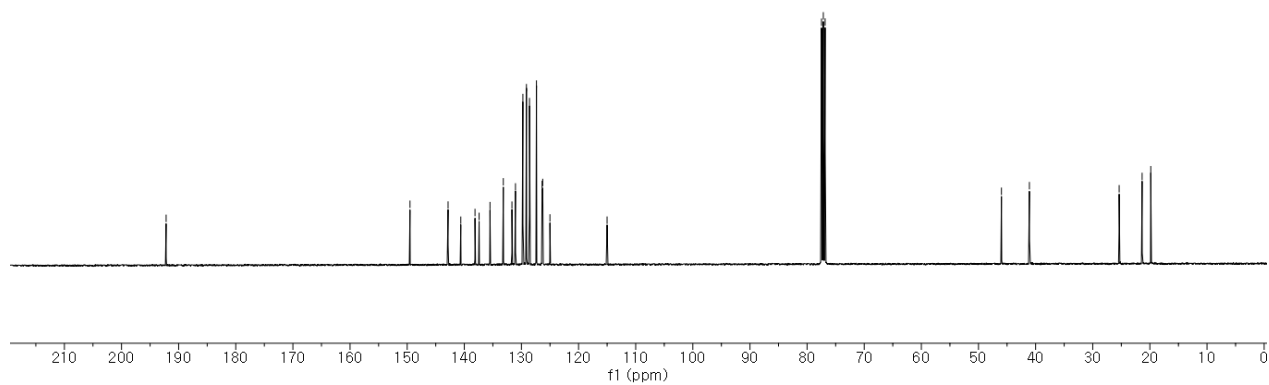
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

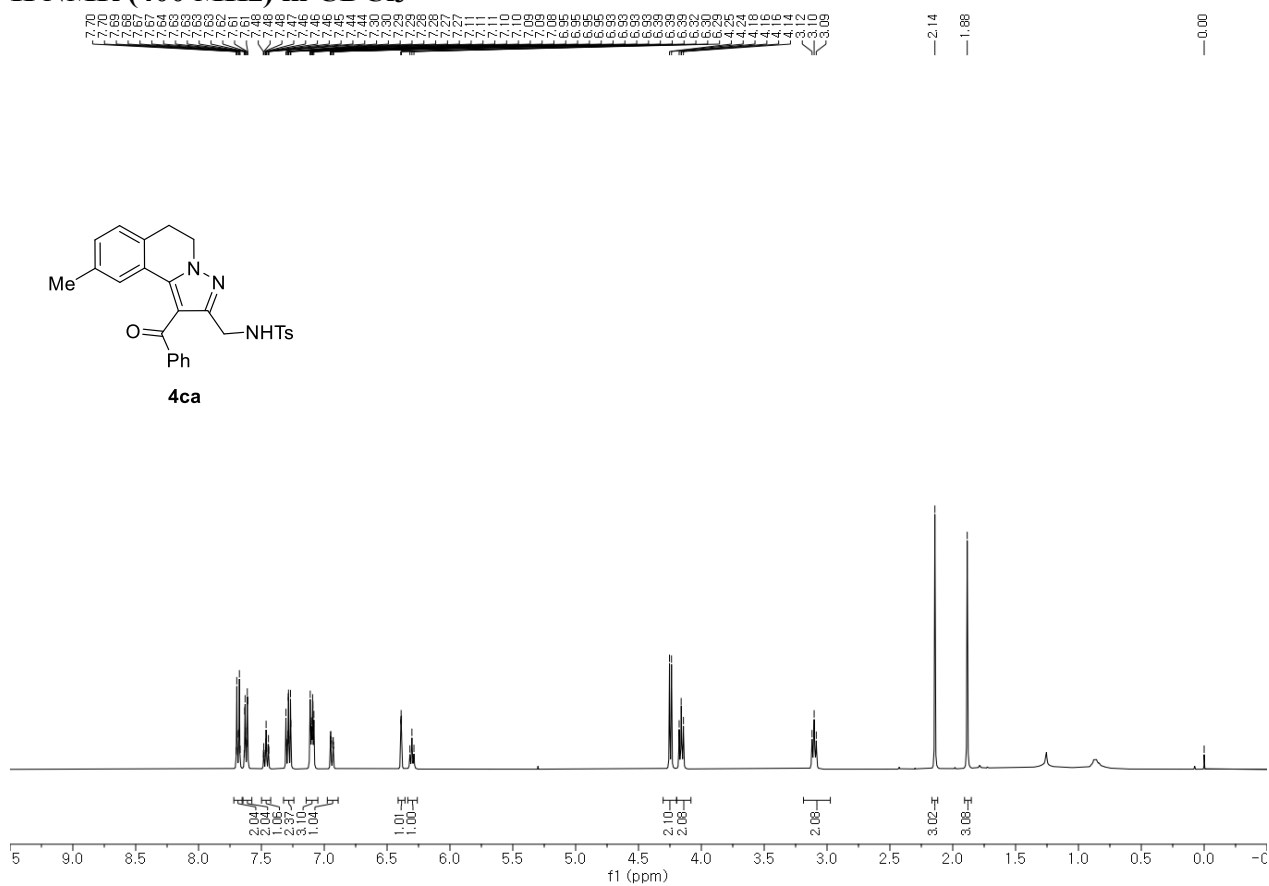
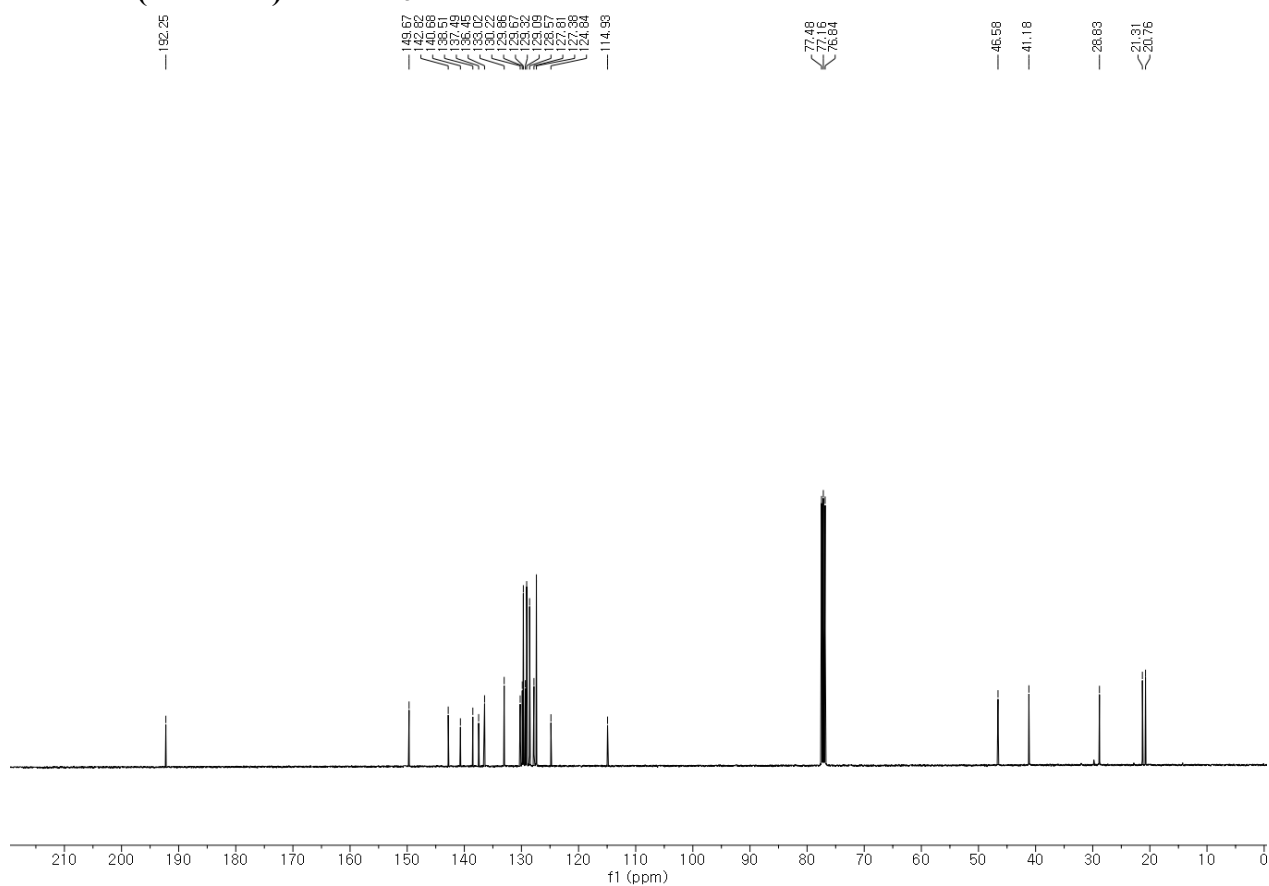
^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

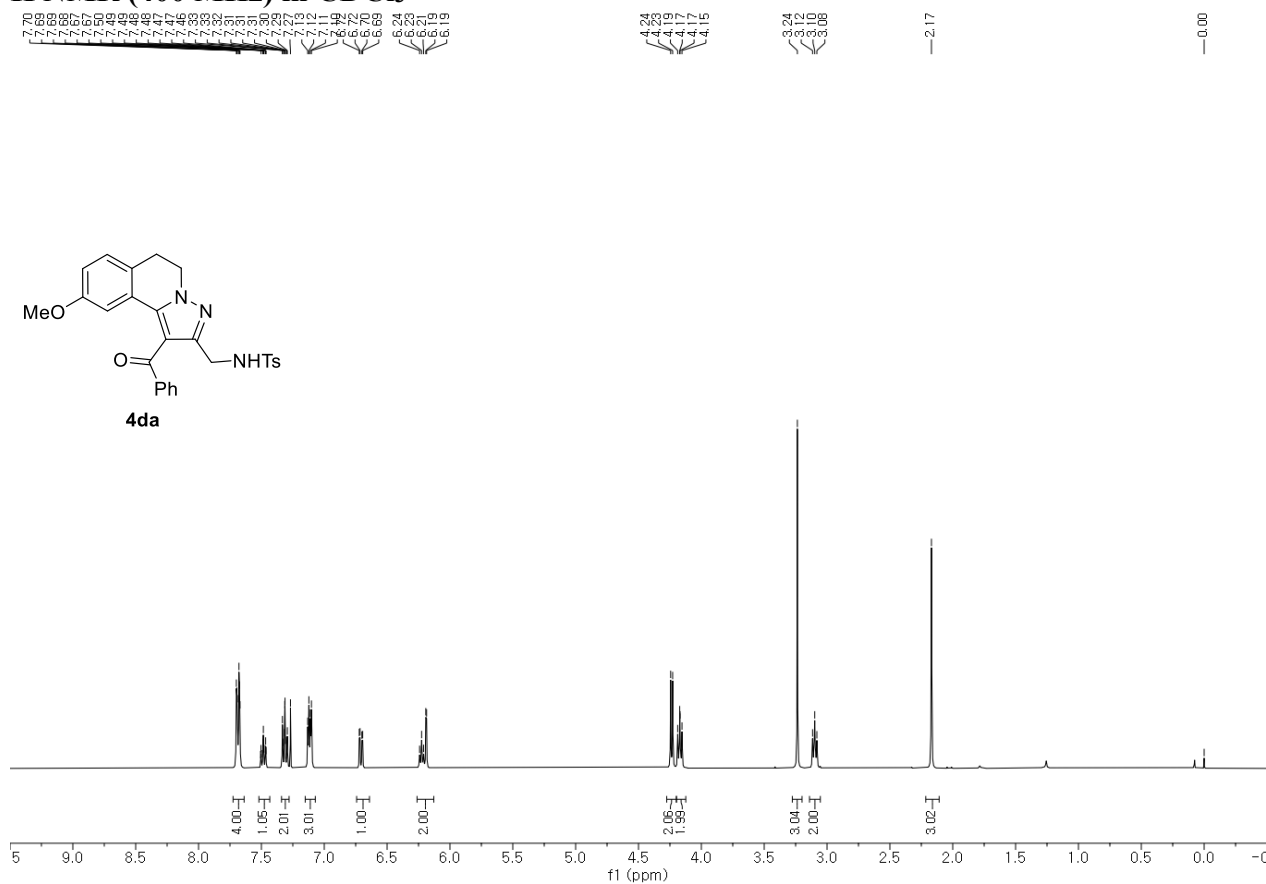
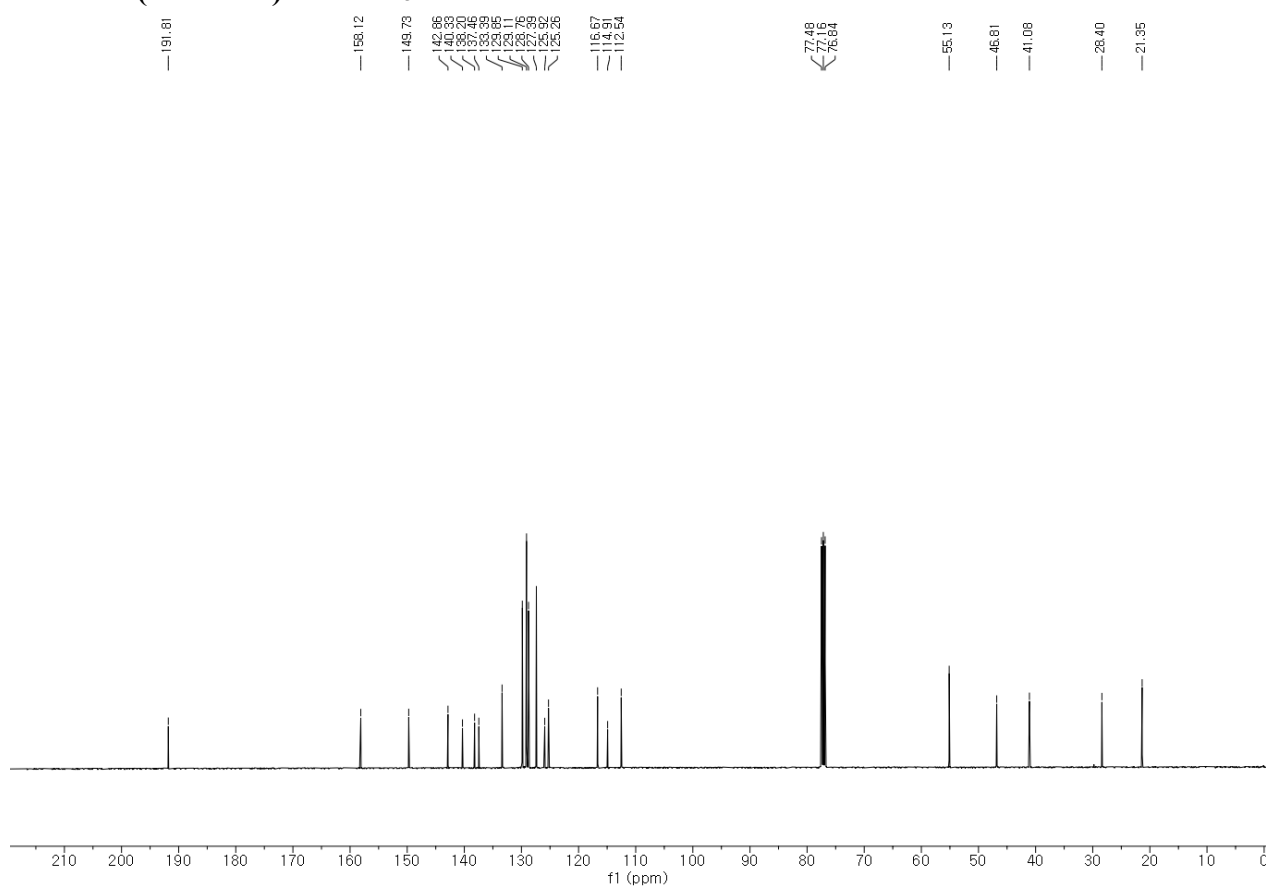
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7.63
7.63
7.63
7.61
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7.44
7.43
7.29
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7.27
7.27
7.25
7.12
7.12
7.11
7.10
7.10
7.10
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6.54
6.52
6.52
6.26
6.23

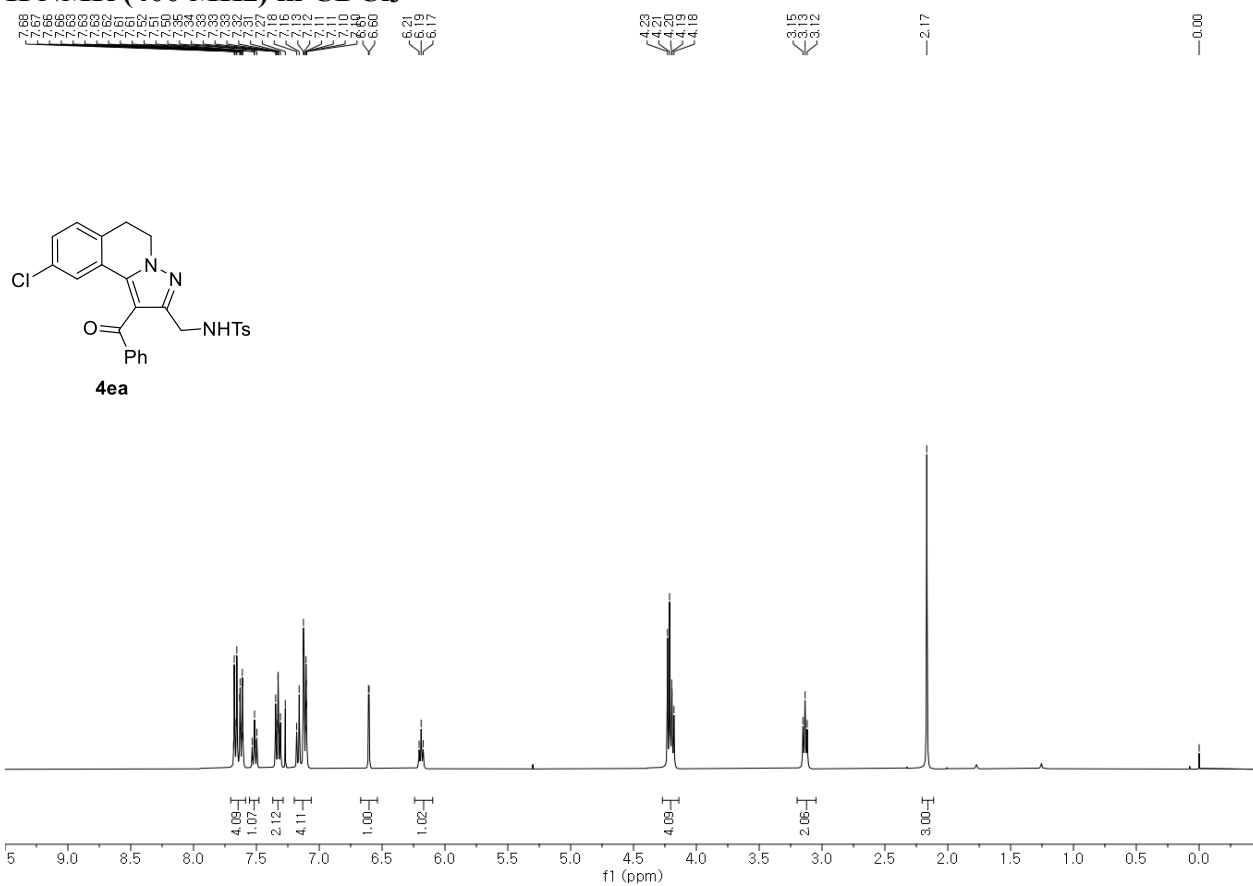
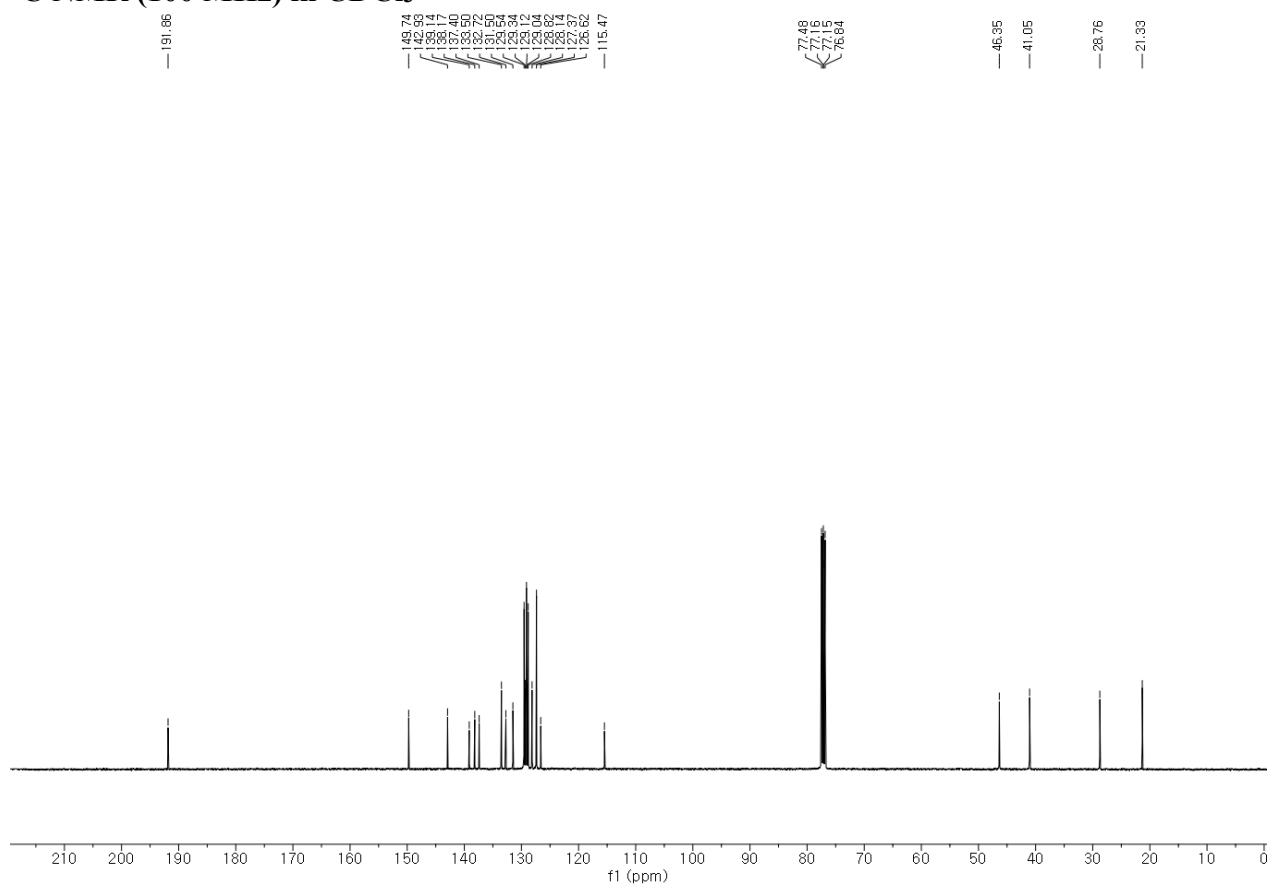


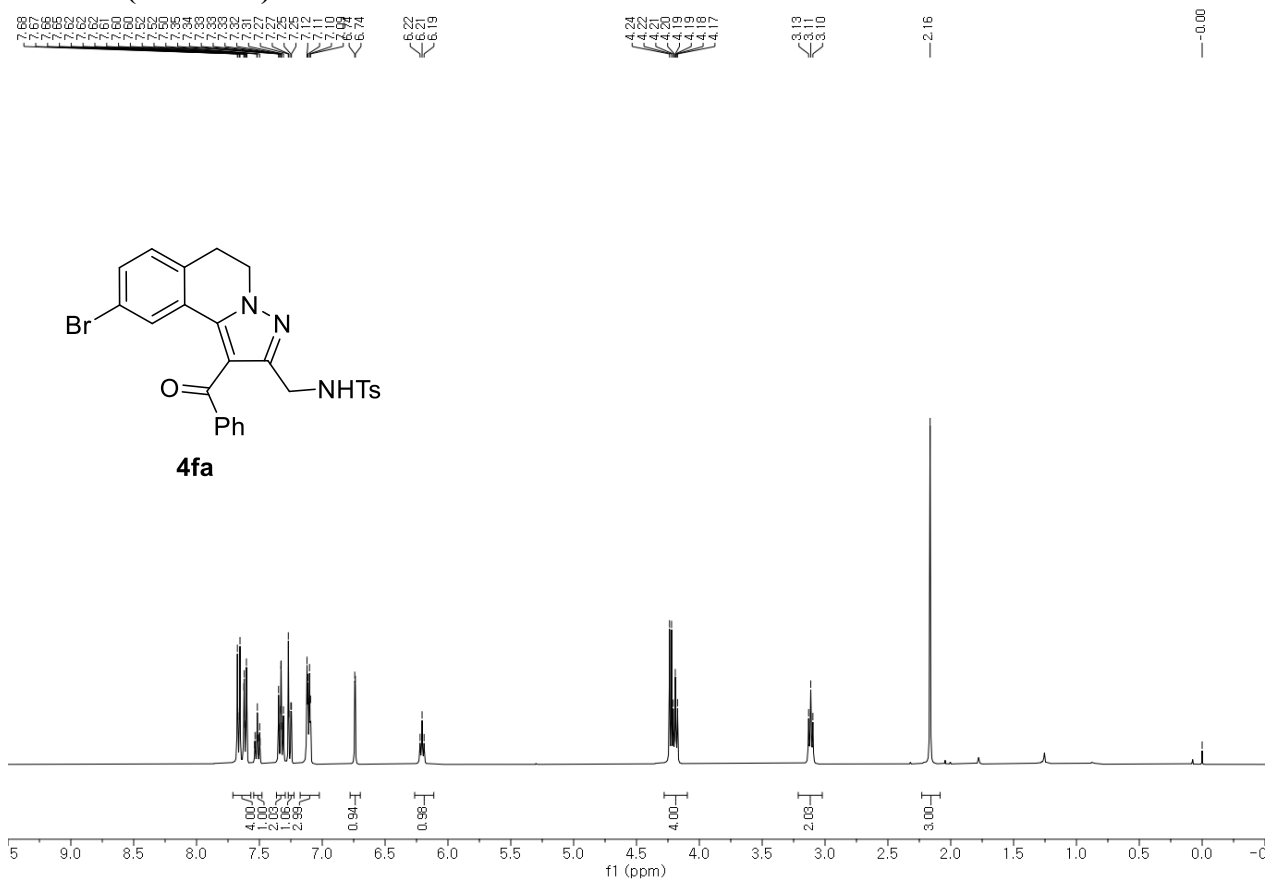
192.19	149.51	77.48	45.98	25.88
142.84	138.12	77.71	41.09	21.86
138.12	135.50	76.94		19.64
135.50	131.04			
131.04	128.75			
128.75	126.52			
126.52	123.97			
123.97	120.39			
120.39	115.01			



^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 

^1H NMR (400 MHz) in CDCl_3  **^{13}C NMR (100 MHz) in CDCl_3** 